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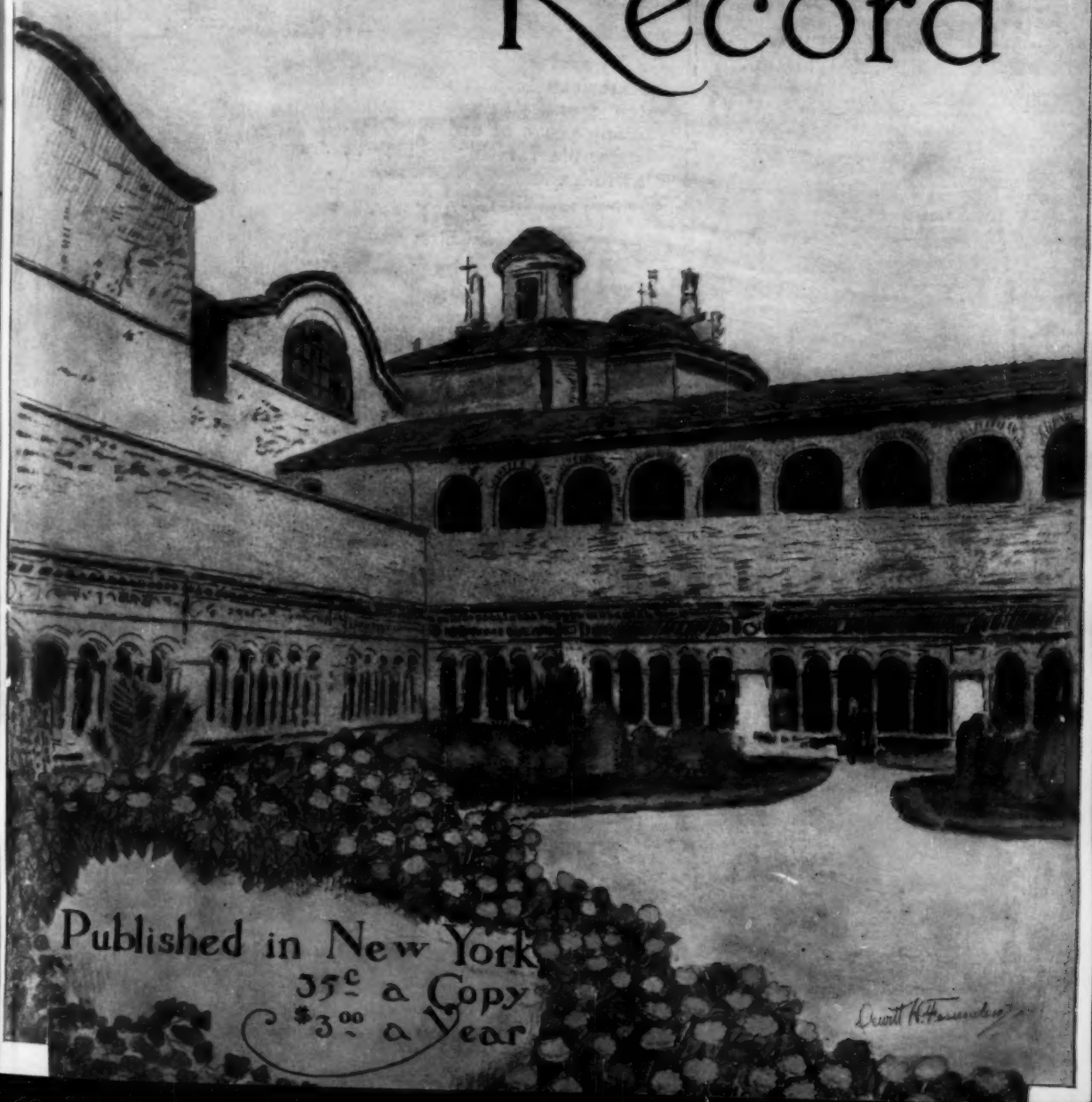

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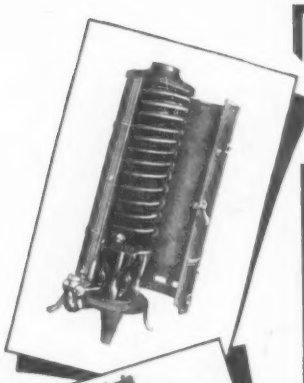

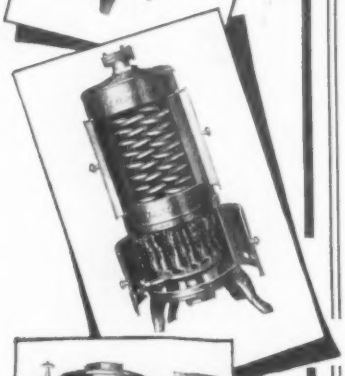

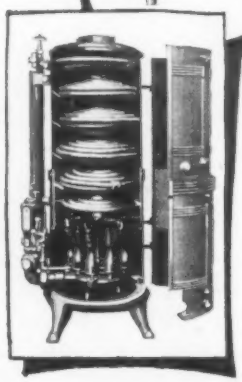

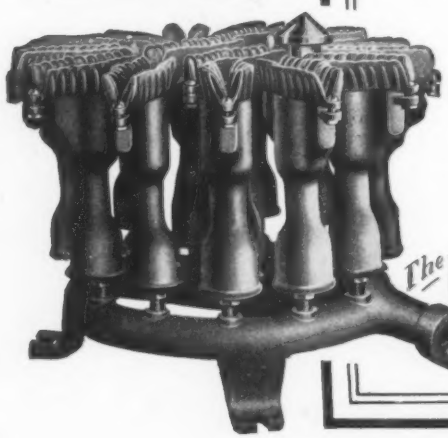

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THE ARCHITECTVRAL RECORD

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Editor: MICHAEL A. MIKKELSEN. Contributing Editor: HERBERT CROLY

Advertising Manager: AUSTIN L. BLACK

Yearly Subscription—United States $3.00 —Foreign $4.00—Single Copies 35 cents

Entered May 22, 1902, as Second Class Matter, at New York, N. Y.

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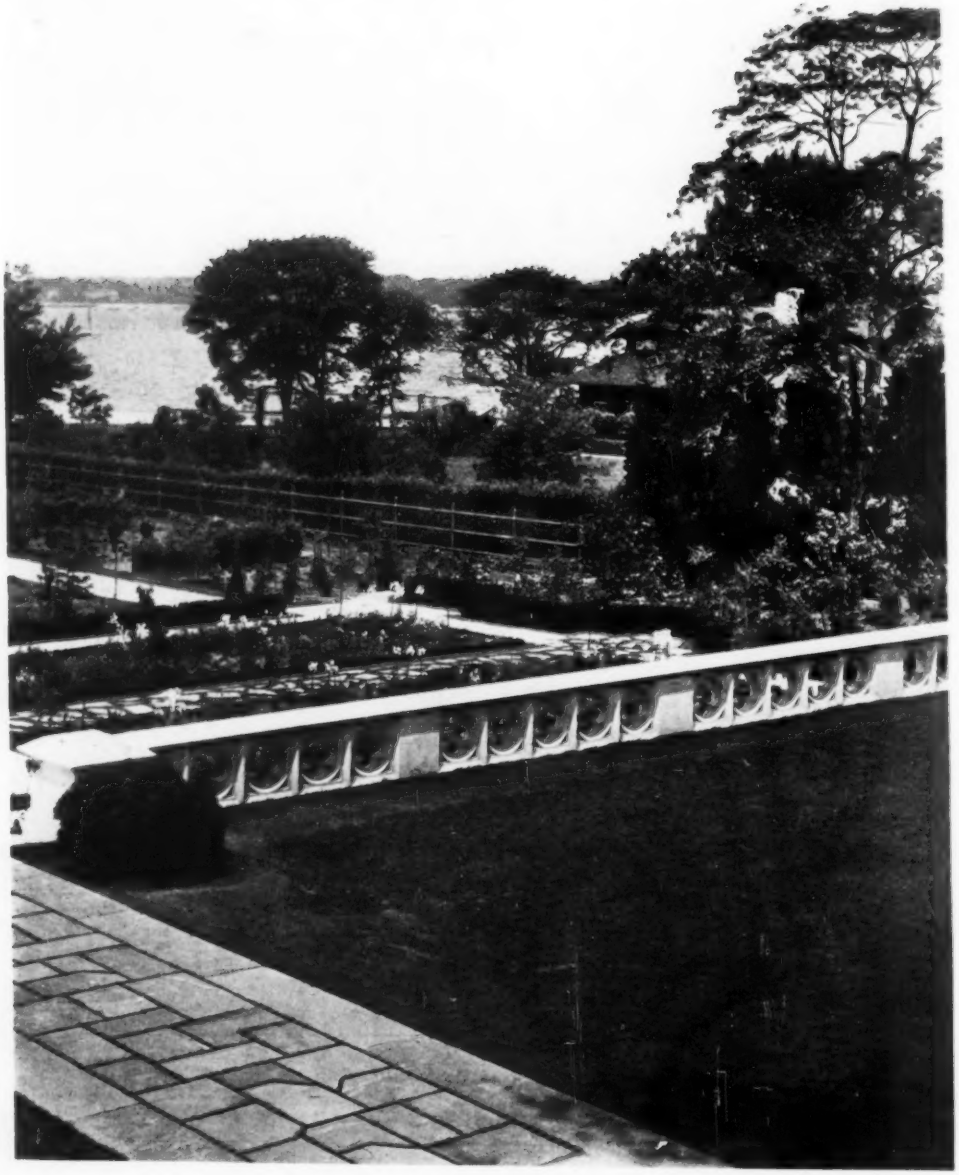
PUBLISHED MONTHLY BY

THE ARCHITECTURAL RECORD COMPANY

115-119 WEST FORTIETH STREET, NEW YORK

F. T. MILLER, Pres. W. D. HADSELL, Vice-Pres. J. W. FRANK, Sec'y-Treas. E. S. DODGE, Vice-Pres.



GARDEN VIEW—RESIDENCE OF MRS. FLORENCE H. MARION, SHIPPAN POINT, STAMFORD, CONN. HUNT & HUNT, ARCHITECTS. WADLEY & SMYTHE, LANDSCAPE ARCHITECTS.

THE ARCHITECTVRAL RECORD

VOLVME XL

NVMBER V

NOVEMBER, 1916

Three Connecticut Country Houses

— Hunt & Hunt, Architects —

By

De Witt H. Fessenden

FOUR miles out of Greenwich, rising from the brow of a hill and guarded by two handsome oaks, is the residence of Mr. H. J. Fisher, a country gentleman's home, of individual design, not favoring any particular period as to style, though possessing in certain respects a leaning towards the Tudor.

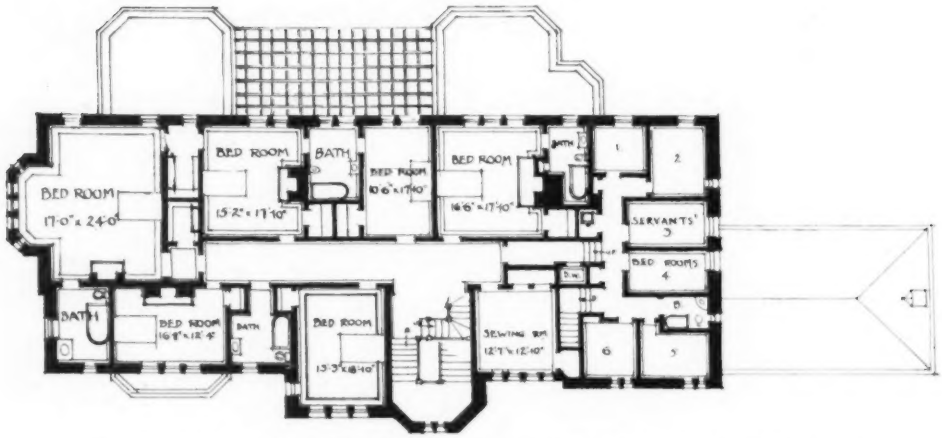
The keynote of the estate is a pronounced suggestion of cheerfulness and hospitality. Houses, like individuals, must either attract or repel, unless, which is the worst, they leave us indifferent. The Fisher house attracts from the moment one enters the gates opening on the broad drive by the side of the formal garden. A feeling of prospective comfort and repose makes its immediate claim.

The lines of the house, in a studied setting of garden and grounds, are given full significance through avoidance of applied ornament. The design depends upon its intrinsic merits for effect.

There is a kinship between the rough field stone of the house and the greenery round about that accords well with the restraint of the design. The warm hues of the field stone, the deep red of the bricks in the terrace walls, and the violet tone of the slate roof make a harmonious blend of color, whatever the season of the year. The general impression is that of a commodious manor house built in quiet good taste upon practical lines.

A vestibule, with cloakroom in attendance, a practical detail so often neglected, conducts one to the main hall, in English oak with panels and pilasters of good proportions. A vista undisturbed by staircase carries the eye through the house to the grounds on the farther side. To the right of the main hall is the staircase hall, with a platform before a leaded glass window to break the flight. Very striking is this bisecting of the house by means of the main hall and the separation of the ascent to the upper floors.

To the left, on entering the vestibule, is the library. This has an excellent Caen stone mantel, while above the book space



SECOND FLOOR PLAN—RESIDENCE OF H. J. FISHER, ESQ., GREENWICH, CONN.
Hunt & Hunt, Architects.

and extending around the apartment are nine panels in fresco by William A. Mackay, portraying scenes from the Holy Grail.

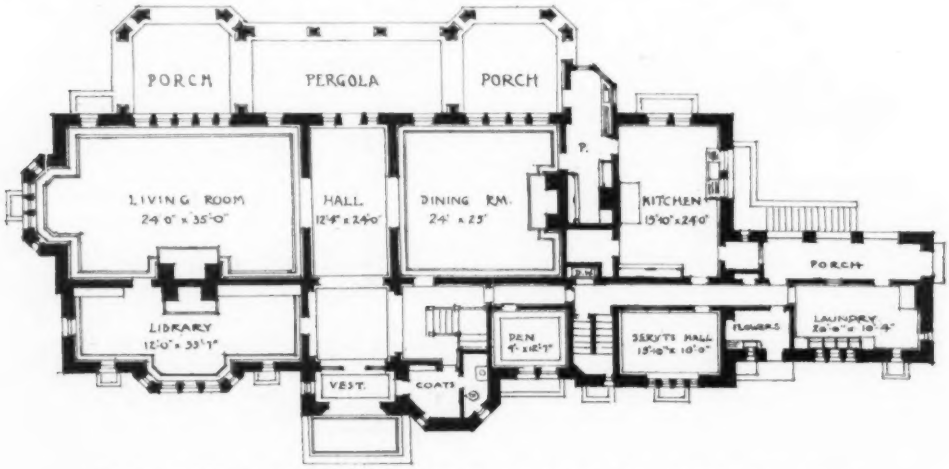
From the library one enters the living room, which is particularly bright and cheerful. The walls of this room are a light brown in tone, matching the hangings and the rug. Of great beauty is the ceiling, panelled in plaster after a handsome Tudor design.

Across the hall, and facing the living room, is the dining room, which has been kept bright and gay with plenty of sunshine. It is delicately panelled, and is painted white in agreeable contrast with the blue of the rug, which is repeated in the curtains and hangings.

Beyond is a spacious pantry that serves equally well the indoor and the outdoor dining room.

The happy mingling of stone and timber, the Tudor windows, the great hall unobstructed by staircase, the majestic oaks in the centre of the approach and the graceful lily pond are features not quickly forgotten.

In the case of Mrs. Florence H. Marion's house at Shippan Point, Stamford, the architects had to deal with a long,



FIRST FLOOR PLAN—RESIDENCE OF H. J. FISHER, ESQ., GREENWICH, CONN.
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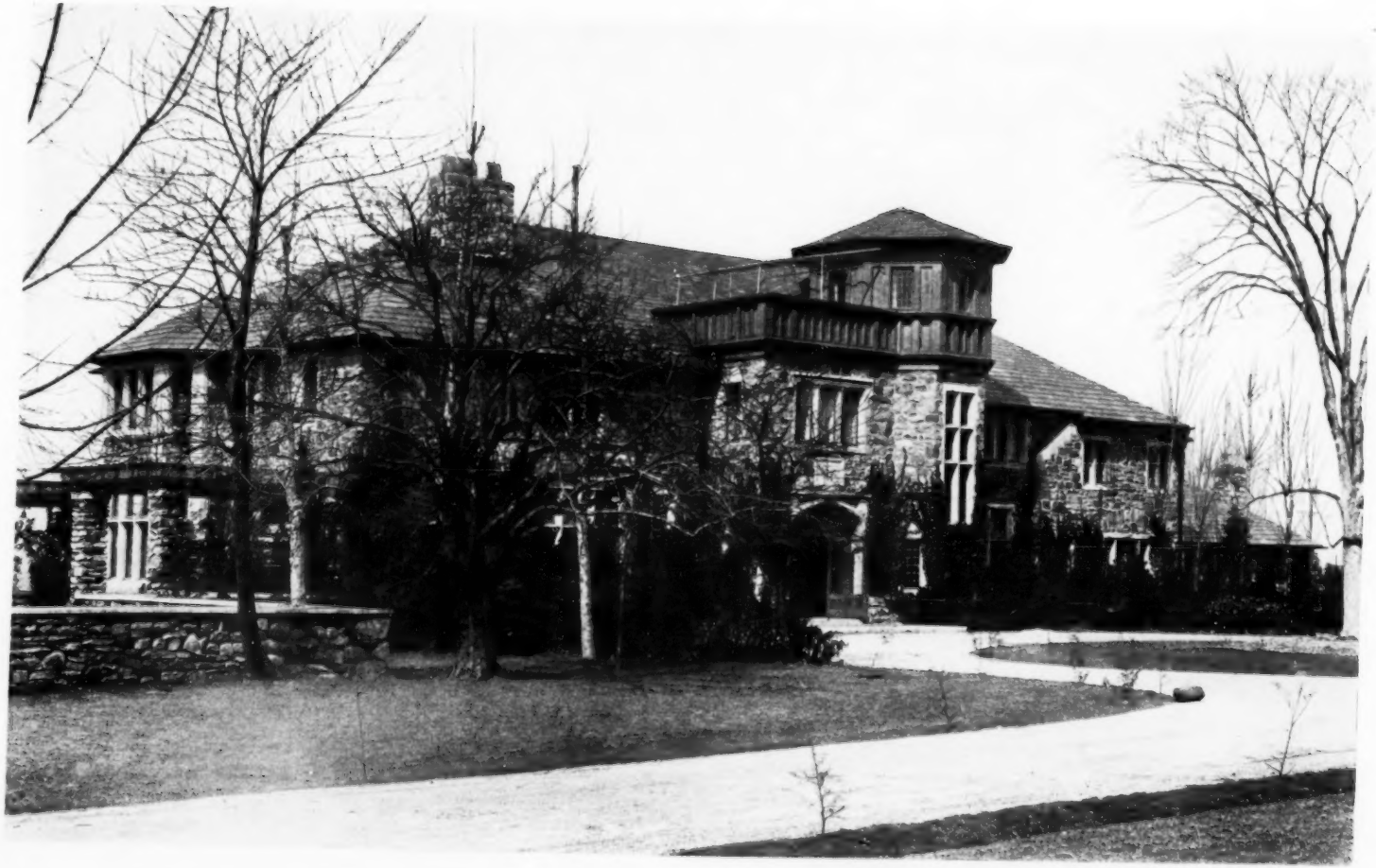

FRONT VIEW—RESIDENCE OF H. J. FISHER, ESQ., GREENWICH, CONN. HUNT & HUNT, ARCHITECTS.

MAIN ENTRANCE—RESIDENCE OF H. J. FISHER, ESQ.,
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ENTRANCE TO GARDEN—RESIDENCE OF H. J. FISHER, ESQ., GREENWICH, CONN. HUNT & HUNT, ARCHITECTS.

MAIN HALL—RESIDENCE OF H. J. FISHER, ESQ., GREENWICH, CONN.
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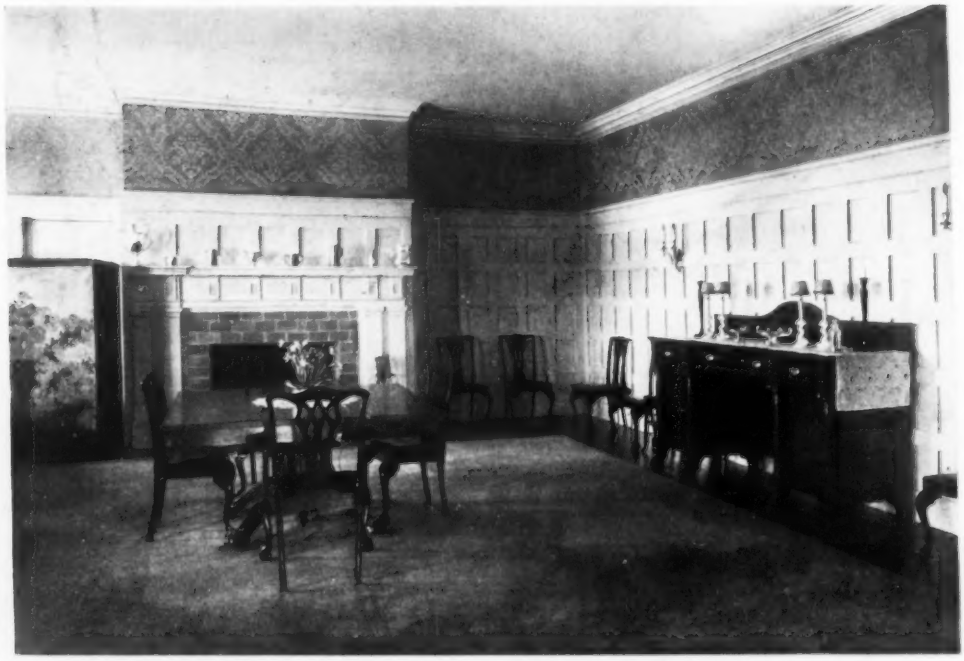
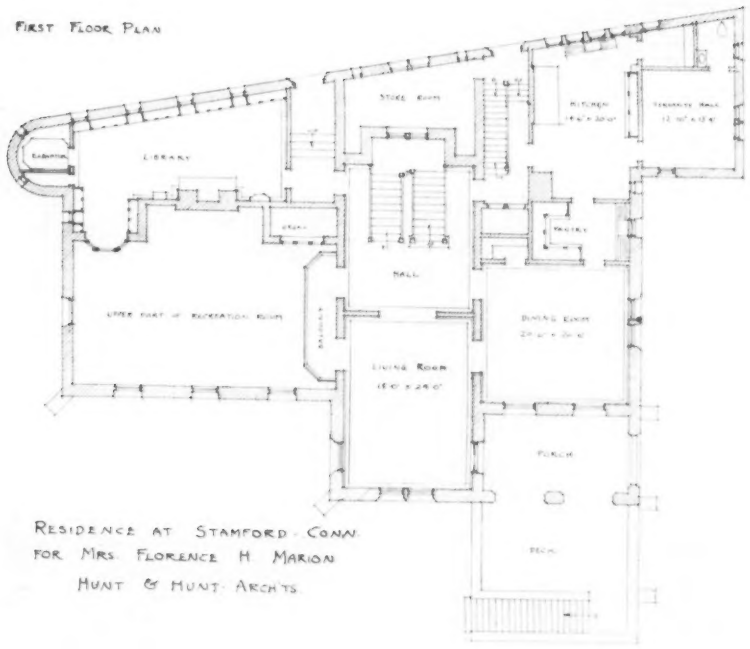


DINING ROOM—RESIDENCE OF H. J. FISHER, ESQ., GREENWICH, CONN.
Hunt & Hunt, Architects.

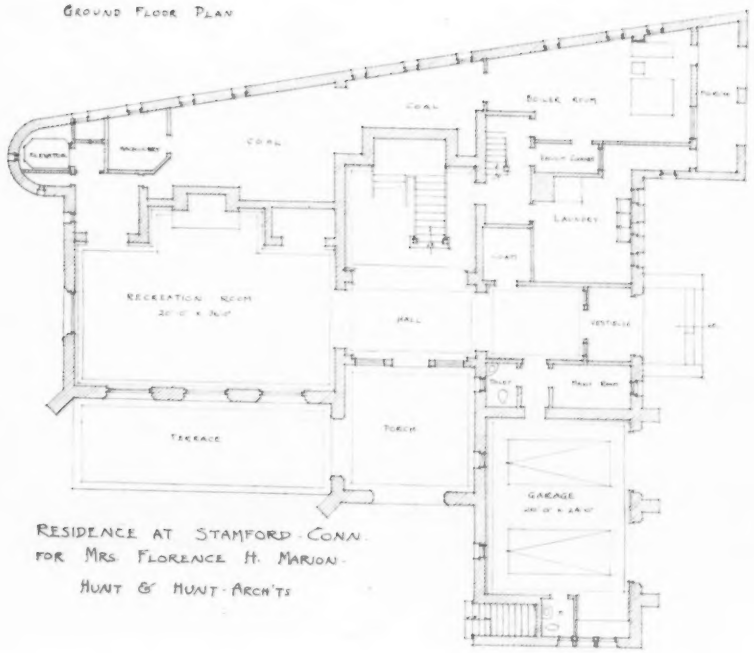
REAR VIEW—RESIDENCE OF H. J. FISHER, ESQ., GREENWICH, CONN. HUNT & HUNT, ARCHITECTS.

FIRST FLOOR PLAN



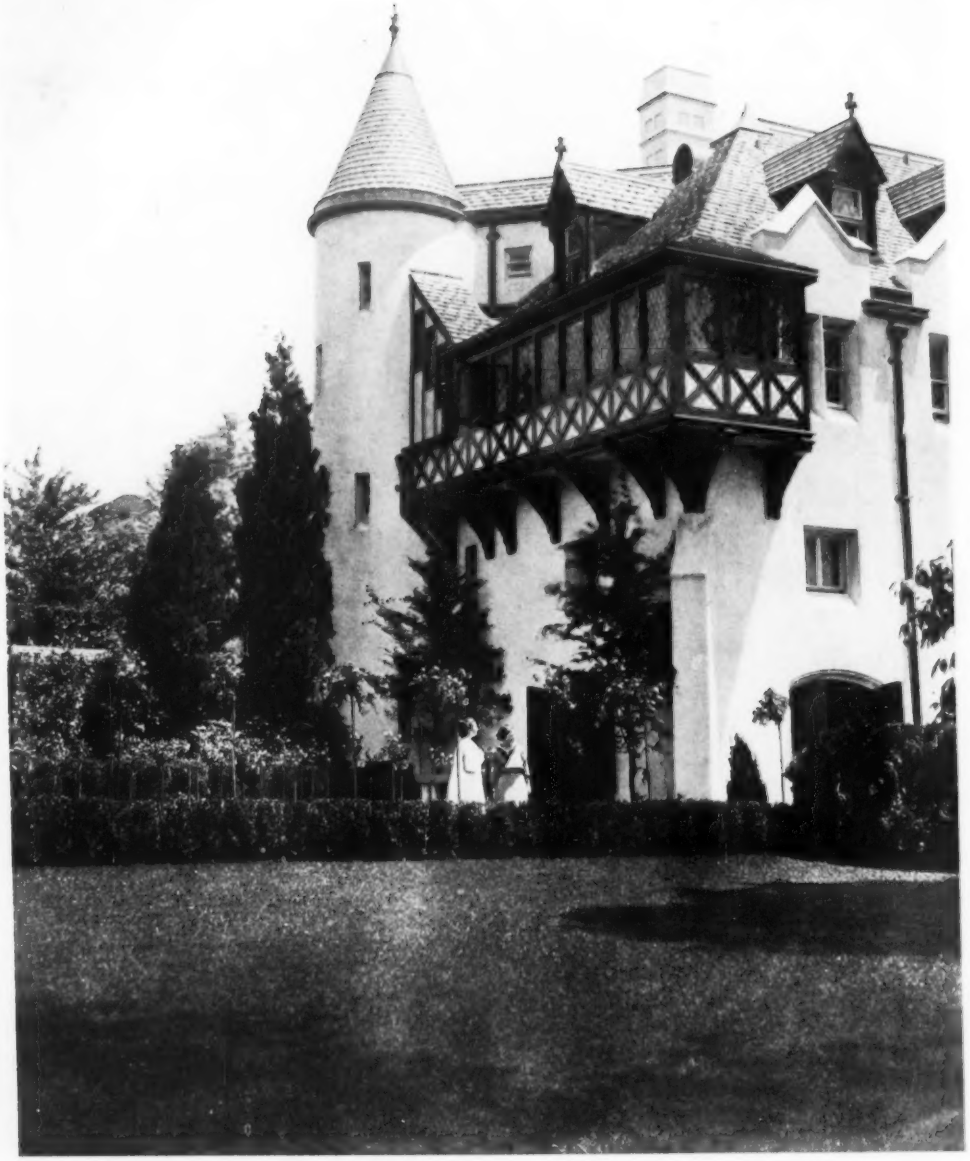
RESIDENCE AT STAMFORD - CONN.
FOR MRS. FLORENCE H. MARION
HUNT & HUNT. ARCH'TS.

GROUND FLOOR PLAN



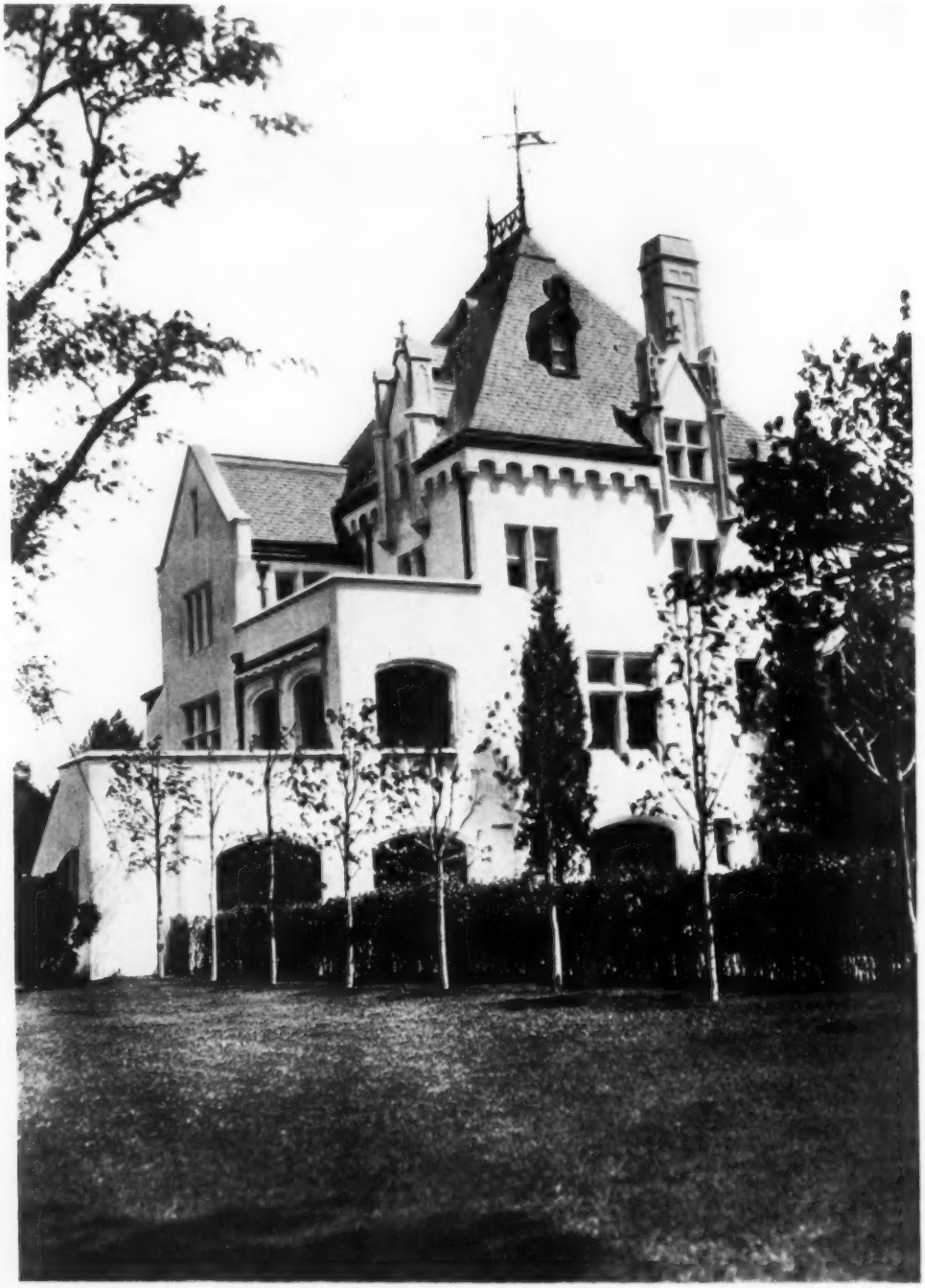
RESIDENCE AT STAMFORD - CONN.
FOR MRS. FLORENCE H. MARION -
HUNT & HUNT - ARCH'TS

EAST ELEVATION—RESIDENCE OF MRS. FLORENCE H. MARION, SHIPPAN POINT, STAMFORD, CONN. HUNT & HUNT, ARCHITECTS.



END ELEVATION—RESIDENCE OF MRS. FLORENCE H. MARION, SHIPPAN POINT, STAMFORD, CONN. HUNT & HUNT, ARCHITECTS.

ENTRANCE FRONT—RESIDENCE OF MRS. FLORENCE H. MARION, SHIPPAN POINT, STAMFORD, CONN. HUNT & HUNT, ARCHITECTS.



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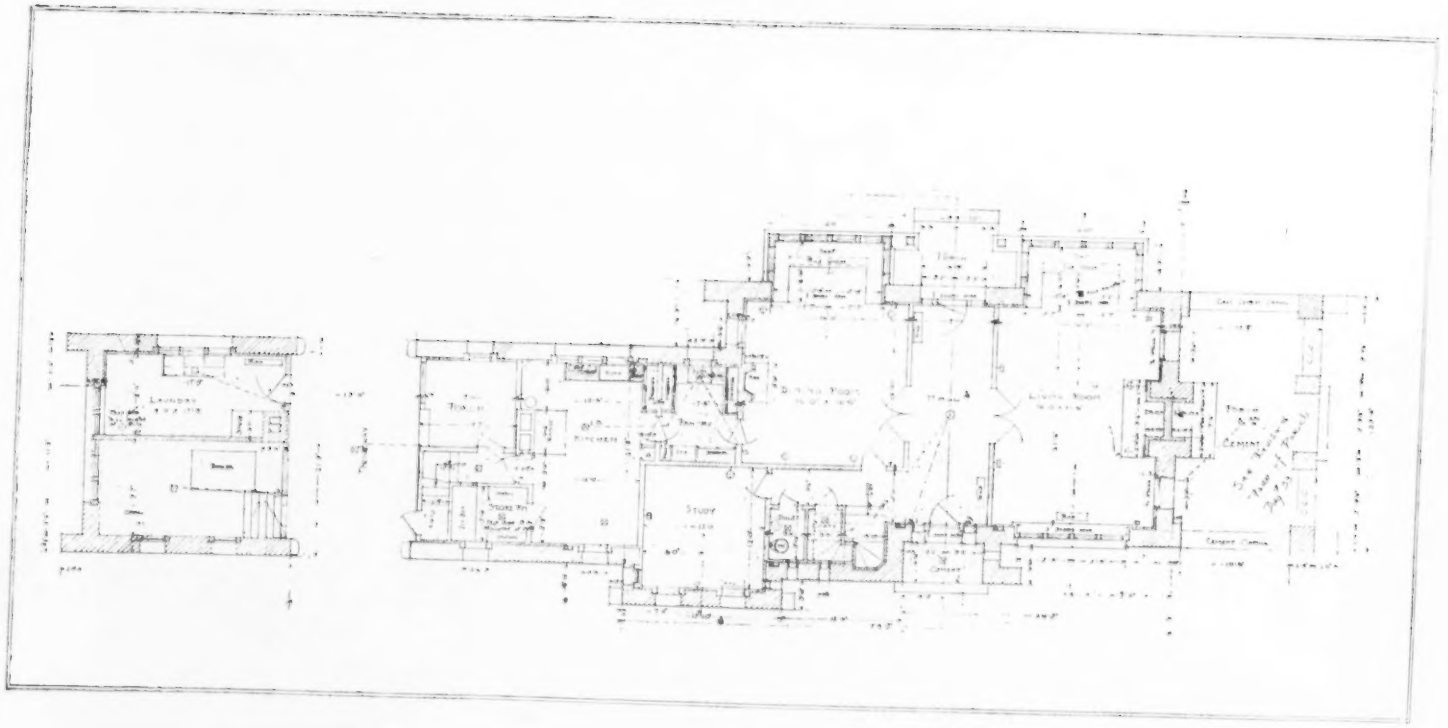


FIRST FLOOR PLAN—RESIDENCE OF THOMAS ROBINS, ESQ., SHIPPAN POINT, STAMFORD, CONN. HUNT & HUNT, ARCHITECTS.

RESIDENCE OF THOMAS ROBINS, ESQ., SHIPPAN POINT, STAMFORD, CONN.
Hunt & Hunt, Architects.

RESIDENCE OF THOMAS ROBINS, ESQ., SHIPPAN POINT, STAMFORD, CONN.
Hunt & Hunt, Architects.

narrow strip of land sloping on the west toward Long Island Sound. It was possible either to build below the slope, toward the sea, or to place the house upon the crest of the property. The latter course won the decision and enabled the architects to develop a beautiful terrace garden commanding a magnificent view across the Sound. The house is flanked on the east by the street and occupies the highest part of the estate, which was laid out in cooperation with the landscape architects, Wadley and Smythe.

The house recalls the French château and, like its prototype, its entrance door, to the east, gives directly upon the sidewalk, the gentle curve of the street being echoed in the contour of the house.

The principal rooms are upon the western, or garden, side, where the ground floor is a story below the street door level. At the south end of the estate a drive makes a winding course to a vestibuled entrance. A garage is built into the house. Adjoining the garage and overlooking the grounds is a covered porch, beyond which is a spacious recreation room, thirty-six feet long, enclosed by rough stone walls, the ceiling occupying two stories in height, like the studio. This room, or hall, fitted with cozy alcoves, is really the living room and centre of family life and entertainment. The great open fireplaces, inviting lounges, pipe organ, and alcoves hung with guns and fishing rods are attractive features. A grand stairway between the entrance and the recreation room rises to the floor above. Adjoining the hall, on the west side, are the living and dining rooms, with fine views over the gardens and grounds. At the north of the hall is a balcony which runs across one end of the recreation room. In the northern end of the house is a library, and beyond it a typical French tower, which, however, besides its circular stairway, contains that very modern feature, an elevator. An interesting item is the little conservatory nestling on the north wall, beside the tower.

The outside is white stucco, relieved by the half-timber work and the slate of the roof, not to mention the variety introduced by the tower and the overhanging conservatory, which, with its wealth of diamond pane windows and its wooden brackets, is an oasis of extraordinary charm. The high buttresses, the deep embrasured windows, the slope of the roof, the ox-eyes and the stately chimneys are picturesque elements in the general simplicity of the design.

In planning the residence of Mr. Thomas Robins for a site that is surrounded upon three sides by the sea at Shippan Point, the architects had in mind a fisherman's cottage. It is constructed of local field stone, and presents a rugged front to the water. The roof, sloping to the first story at one end of the house, gives an interesting appearance. There is a fitness of accord between this solid stone erection and the waters of the Sound, which lap so close to its foundations.

At one side of the entrance gate is the garage, with a boathouse on the other, the drive passing between the two, circling around to the service entrance at the end of the building and continuing along the side of the house to the main entrance.

The rear of the house is toward the highway, where the entrance gate opens upon a private road. There are no elaborate details, nothing, in fact, to detract from the pleasure of the mason's craft in the stonework. The circular entrances are well balanced by the lunettes of the porch and the massive chimneys rising squarely between.

The front door opens directly into the vestibule and hall, which divide the house. The hall and the living room are panelled in English oak, the dining room is panelled in hardwood and painted gray. These main rooms are on opposite sides of the hall.

How well the multi-colored facets of the stone harmonize with the environment can be appreciated even in half-tone illustrations. The private road, with its broad parapet, forms an elliptical ring about the property, giving a graceful and characteristic setting.

FIG. 1. ENTRANCE FRONT, WEST—SOUTH SHORE COUNTRY CLUB, CHICAGO. MARSHALL & FOX, ARCHITECTS.

FIG. 2. FOUNTAIN COURT AND ENTRANCE TO SOLARIUM.

The South Shore Country Club, Chicago—Marshall & Fox, Arch'ts

By Peter B. Wight

THE South Shore Country Club, in Chicago, lies entirely within the city. When it was established, shortly after the Washington Park Club went out of existence, it was located on a site which had no attractions peculiar to the country. The only natural one the site had was Lake Michigan, which bounds its eastern line, and, of course, it could have none greater. However, the land was barren and unattractive, not easy to approach except through Jackson Park, which adjoins it on the north. But a residence district has now grown up adjacent to it, and parkways or boulevards have been constructed on the sides where it does not have the lake frontage. Its main entrance is at the angle formed by these parkways, and a railway station for suburban trains has been established at that point. The parkways are being rapidly built up with high-class apartment houses and private residences, and the club will soon be absolutely removed from every countryside environment. It will have the unique distinction of being a country club within a city.

It was proposed, when the new club house was completed, to omit the word "country" from its name; but this proposition was not supported. The club felt it to be its duty to develop an appropriate landscape on its grounds, and the architects proceeded to make a new plan of the

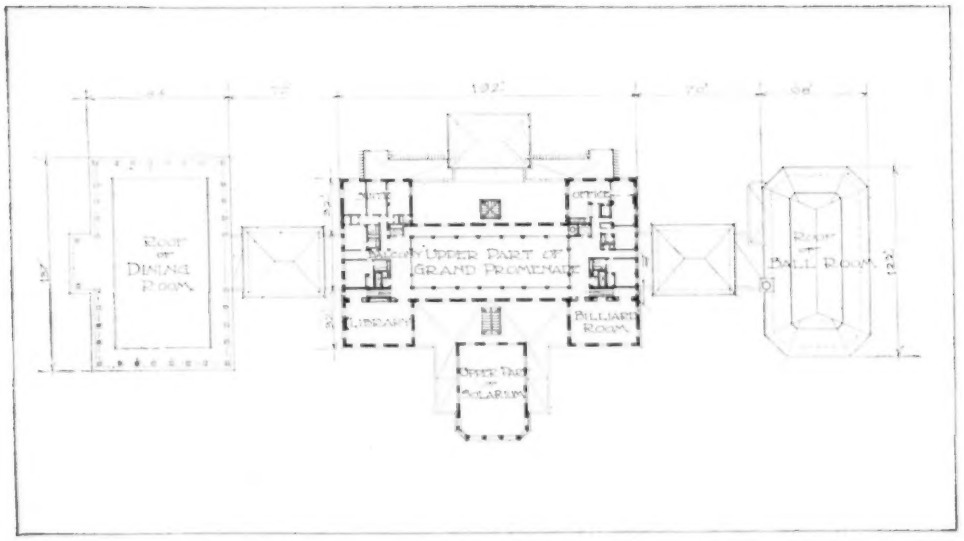


FIG. 3. PLAN OF MEZZANINE FLOOR—SOUTH SHORE COUNTRY CLUB, CHICAGO.
Marshall & Fox, Architects.

property in harmony with the purpose of the club buildings.

A brief history of the club was admirably set forth in an address by its president, Everett C. Brown, at the opening of the new house last January. It was founded ten years ago through the indefatigable efforts of Lawrence Heyworth, of Chicago. The first part of the site purchased comprised only five acres at the north, or sharp, end of the present grounds, adjoining Jackson Park. But before anything was done toward the erection of buildings, the whole area now comprised within the grounds of the club, amounting to sixty-five acres, had been

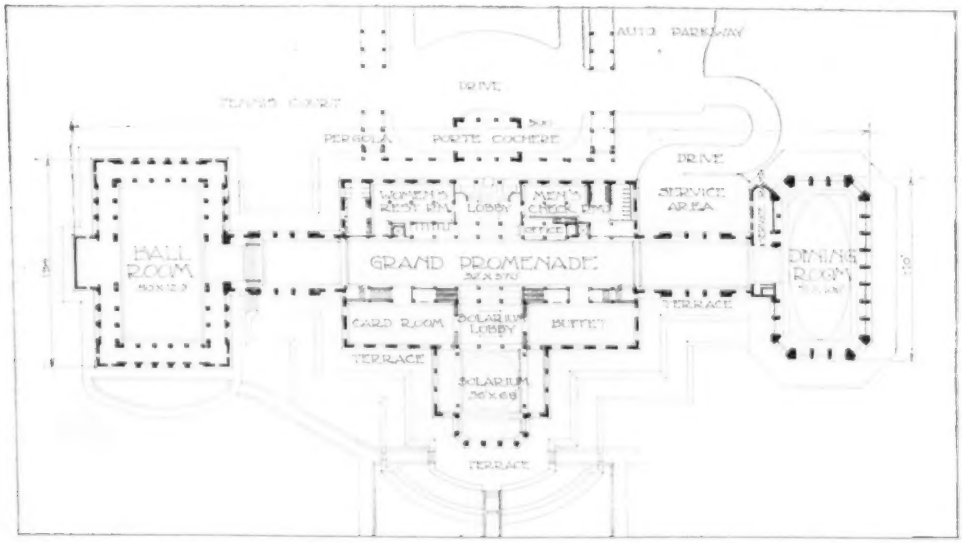


FIG. 4. PLAN OF FIRST FLOOR—SOUTH SHORE COUNTRY CLUB, CHICAGO.
Marshall & Fox, Architects.

purchased. The tract extends three-quarters of a mile along the shore of Lake Michigan. Marshall and Fox, of Chicago, were engaged as architects for all buildings and the grounds at the inception of the project.

The original club house was of light construction, though very large. It was 313 feet long. The ballroom, erected shortly after the completion of the first building, is of concrete construction 130 by 86 feet. It remains in its original position.

Two and a half years ago it was decided to erect a new club house and to retain the ballroom as part of the building. The old club house was moved away from the ballroom to a site near the southeast corner of the grounds. It is still in use for purposes connected with the scheme of the club. The new building, designed by Marshall and Fox, was put under contract on February 18, 1915, at a cost, including furnishing, of $450,000. It is all of substantial construction, and is fireproof so far as the materials used and the constructive methods employed will make it. The outer walls and interior construction consist of a skeleton of reinforced concrete columns and girders, filled in with hollow burned clay tiles and finished on the outside with cement stucco and pebble dash.

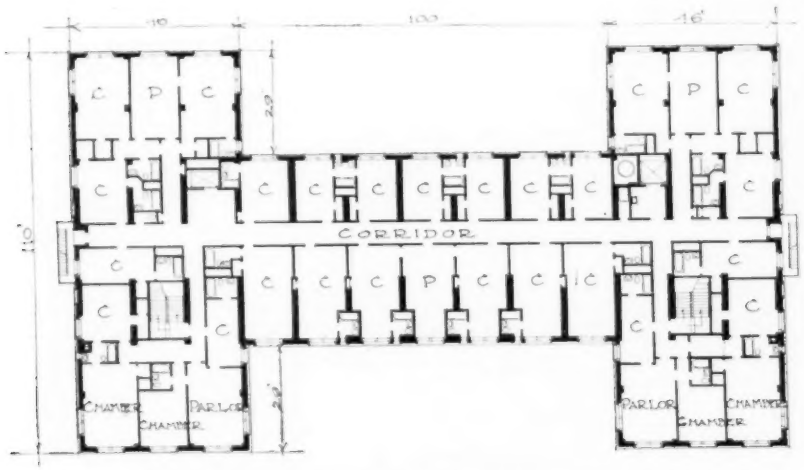


FIG. 5. PLAN OF SECOND FLOOR—SOUTH SHORE COUNTRY CLUB, CHICAGO.
Marshall & Fox, Architects.

The design is very plain and severe, the picturesque effect being given by the irregular ground plan, projecting eaves, towers and exterior concrete colonnades. The ballroom is surrounded with reinforced concrete piers and columns, which support the roof; and the dining room is of similar construction. The plan of the new building, in its general features, is similar to that of the old one, but very much larger. The necessity for the new building was mainly due to the demand for a much larger dining room. This is now 110 by 60 feet in dimensions on the outside, and is finished as an oval in the interior. A wide terrace extends around it, upon which the windows open to the floor.

The ballroom, at the south end, is 134 by 80 feet on the outside. The dining room and the ballroom are connected by the grand promenade, 372 feet long and 32 feet wide. The entire length of the building over all is 500 feet. The height of ceiling of the central section of the grand promenade includes the first story and the mezzanine story. This part has a length of 176 feet.

Opposite the main entrance is the solarium, which commands a view of the water on three sides. It is the main reception and conversation room—74 by 62 feet. On its north side is the men's

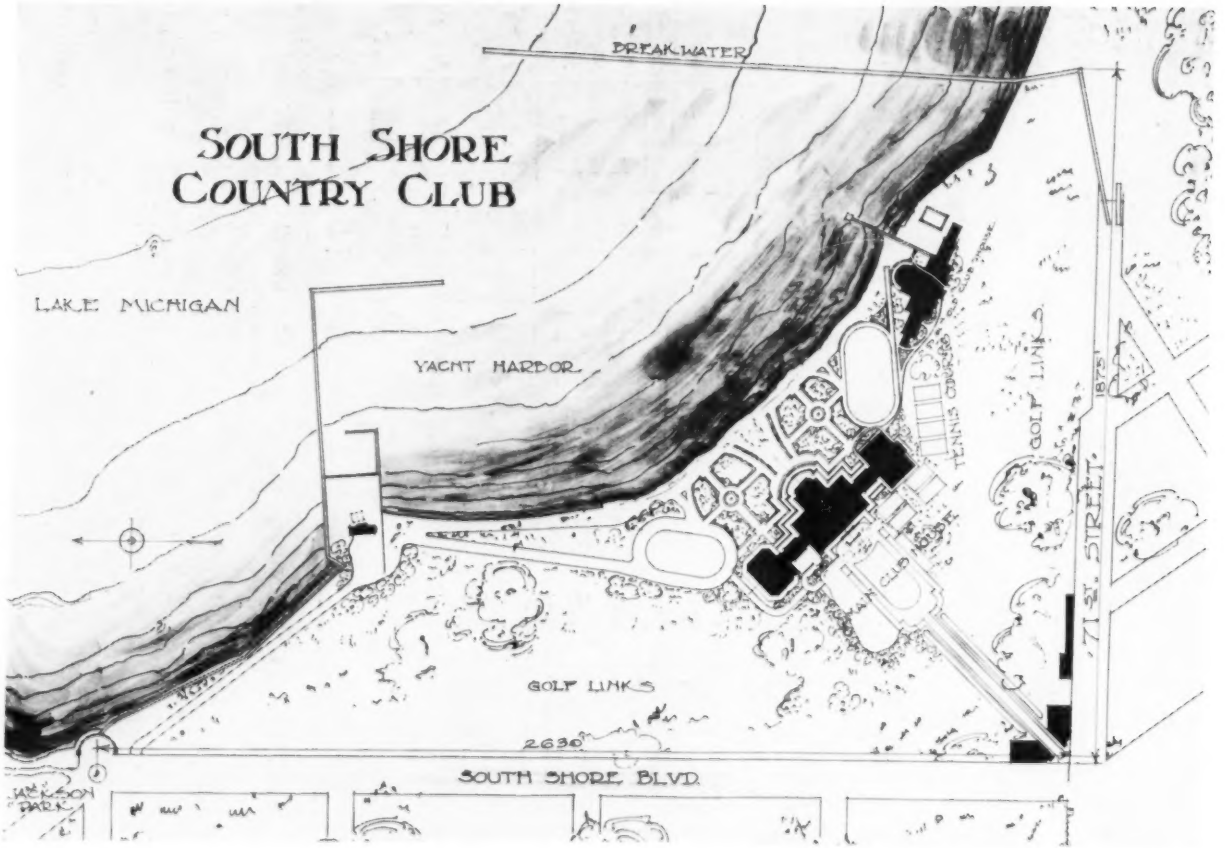


FIG. 6. PLAT PLAN—SOUTH SHORE COUNTRY CLUB, CHICAGO. MARSHALL & FOX, ARCHITECTS.

FIG. 7. SOUTH SHORE COUNTRY CLUB, CHICAGO, AS SEEN FROM THE GOLF LINKS, S. W. MARSHALL & FOX, ARCHITECTS.

FIG. 8. SOUTH SHORE COUNTRY CLUB, CHICAGO, AS SEEN FROM A BOAT ON LAKE MICHIGAN, S.E. MARSHALL & FOX, ARCHITECTS.

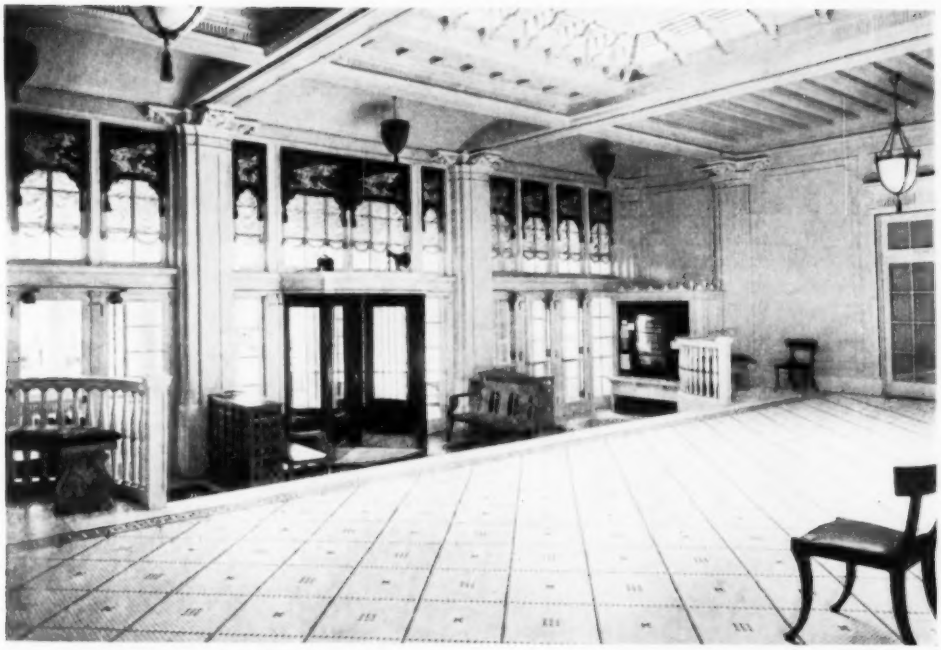


FIG. 9. ENTRANCE VESTIBULE—SOUTH SHORE COUNTRY CLUB, CHICAGO.
Marshall & Fox, Architects.

FIG. 10. FOUNTAIN COURT AND SOLARIUM, LOOKING EAST—SOUTH SHORE COUNTRY CLUB, CHICAGO.
Marshall & Fox, Architects.

FIG. 11. SOLARIUM, LOOKING N.W.—SOUTH SHORE COUNTRY CLUB, CHICAGO.
Marshall & Fox, Architects.

FIG. 12. MEN'S BUFFET, ADJOINING SOLARIUM—SOUTH SHORE COUNTRY CLUB, CHICAGO.
Marshall & Fox, Architects.

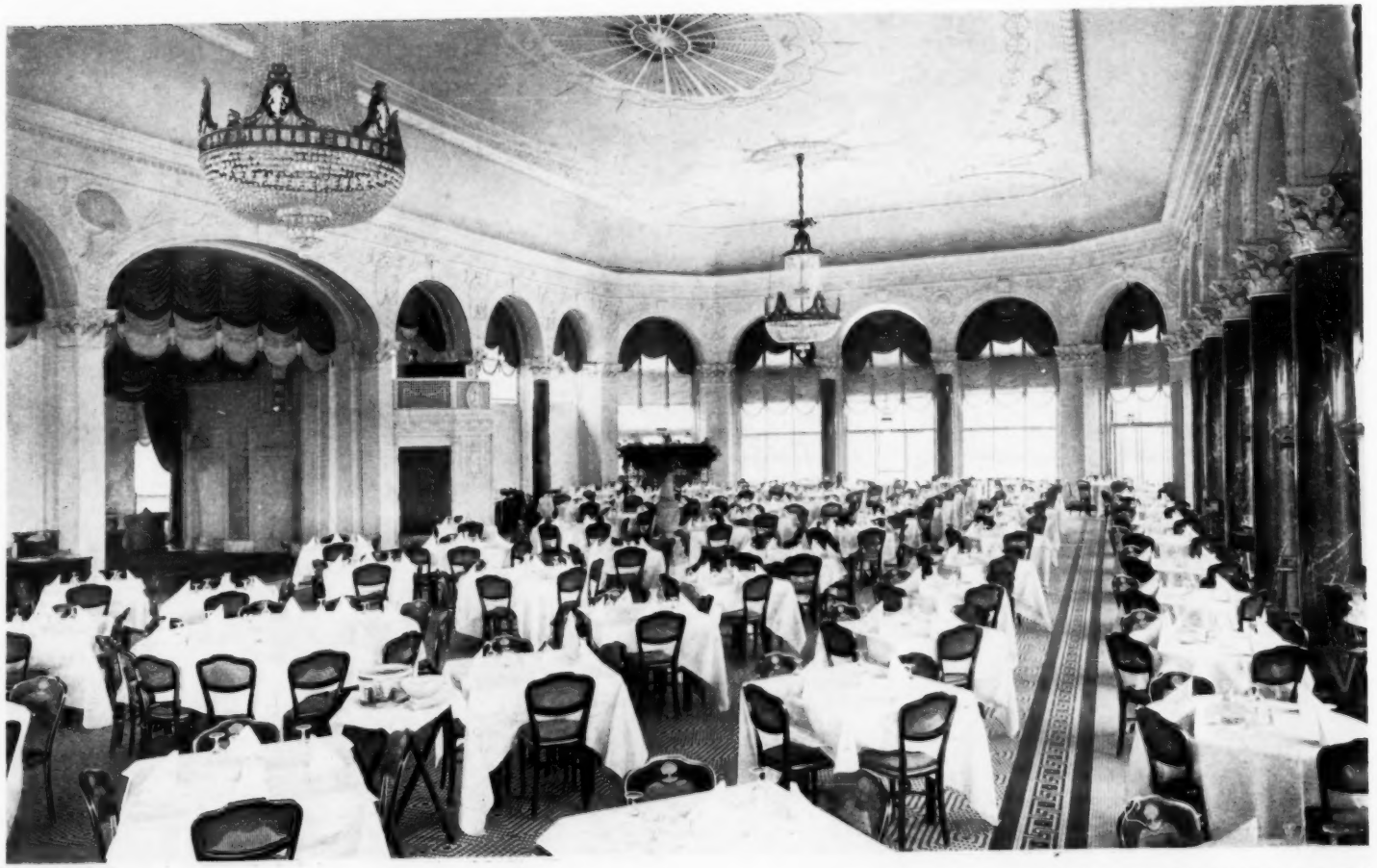


FIG. 13. GRAND DINING ROOM—SOUTH SHORE COUNTRY CLUB, CHICAGO. MARSHALL & FOX, ARCHITECTS.

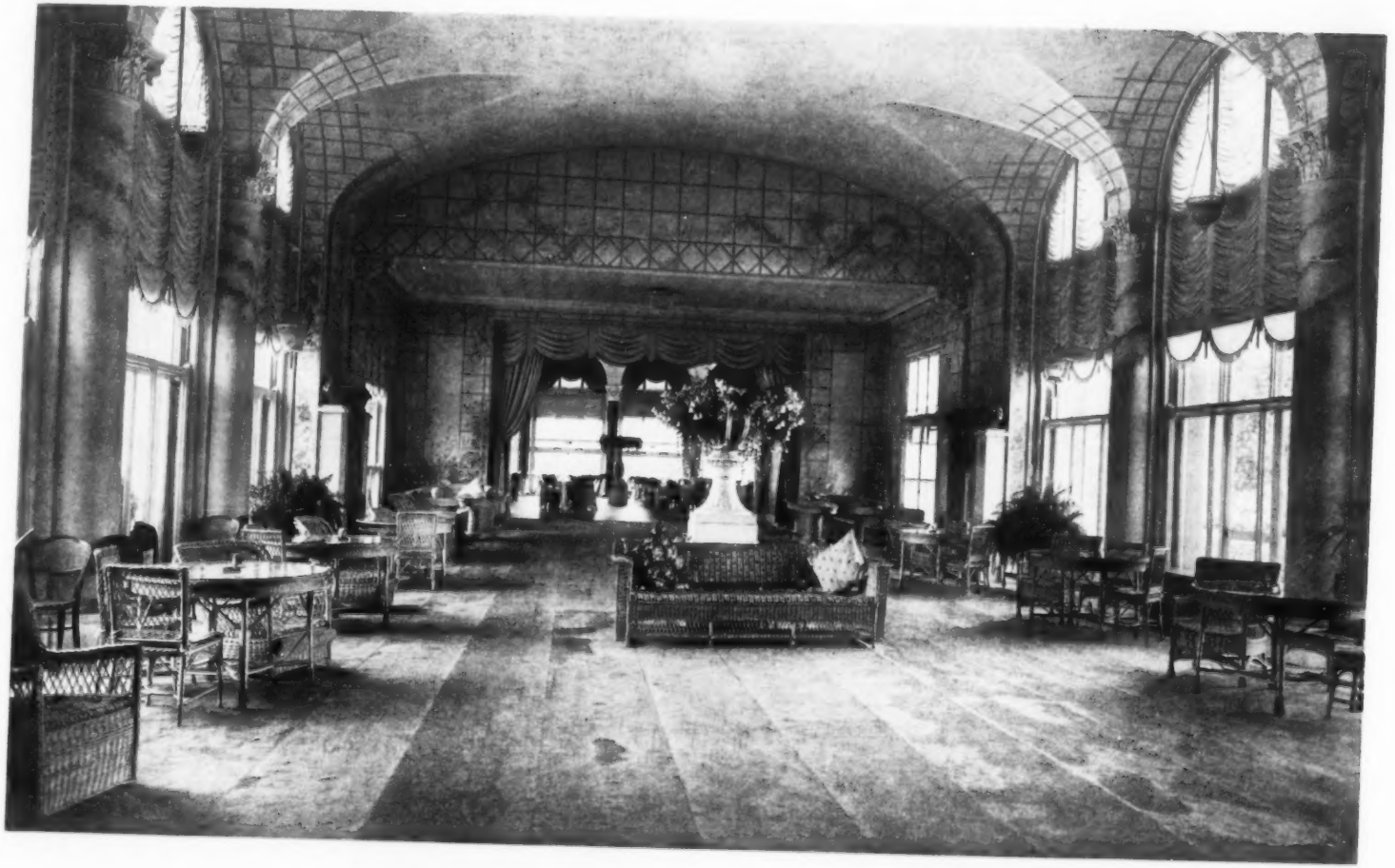


FIG. 14. GRAND PROMENADE, LOOKING NORTH, TOWARD THE GRAND DINING ROOM—SOUTH SHORE COUNTRY CLUB, CHICAGO. MARSHALL & FOX, ARCHITECTS.

FIG. 15. GRAND PROMENADE, CENTRAL SECTION, LOOKING SOUTH, TOWARD THE BALLROOM—SOUTH SHORE COUNTRY CLUB, CHICAGO. MARSHALL & FOX, ARCHITECTS.

FIG. 16. GRAND PROMENADE, LOOKING SOUTH. A NEARER VIEW OF THE BALLROOM—SOUTH SHORE COUNTRY CLUB, CHICAGO. MARSHALL & FOX, ARCHITECTS.

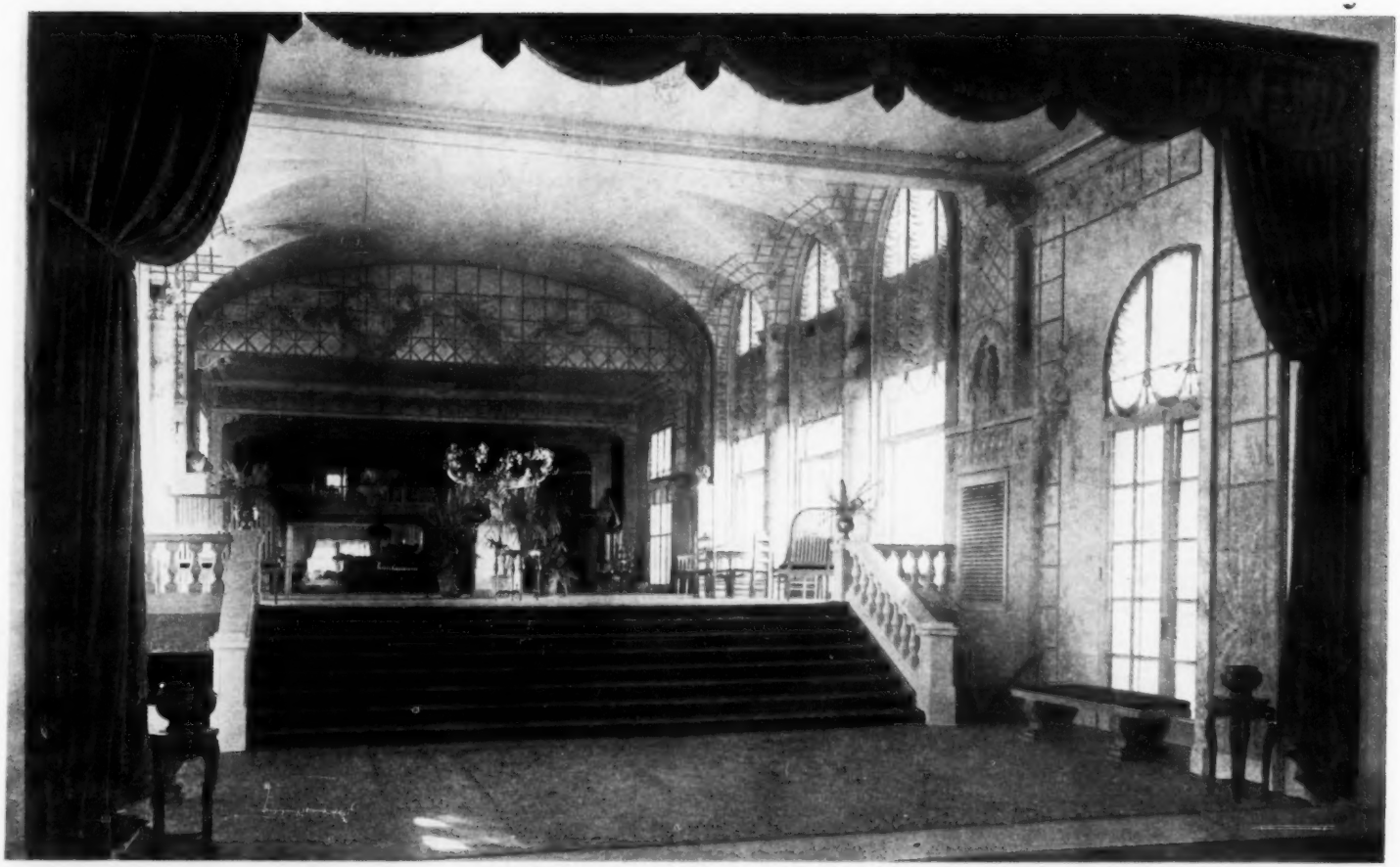


FIG. 17. GRAND PROMENADE, AS SEEN FROM THE BALLROOM—SOUTH SHORE COUNTRY CLUB, CHICAGO. MARSHALL & FOX, ARCHITECTS.

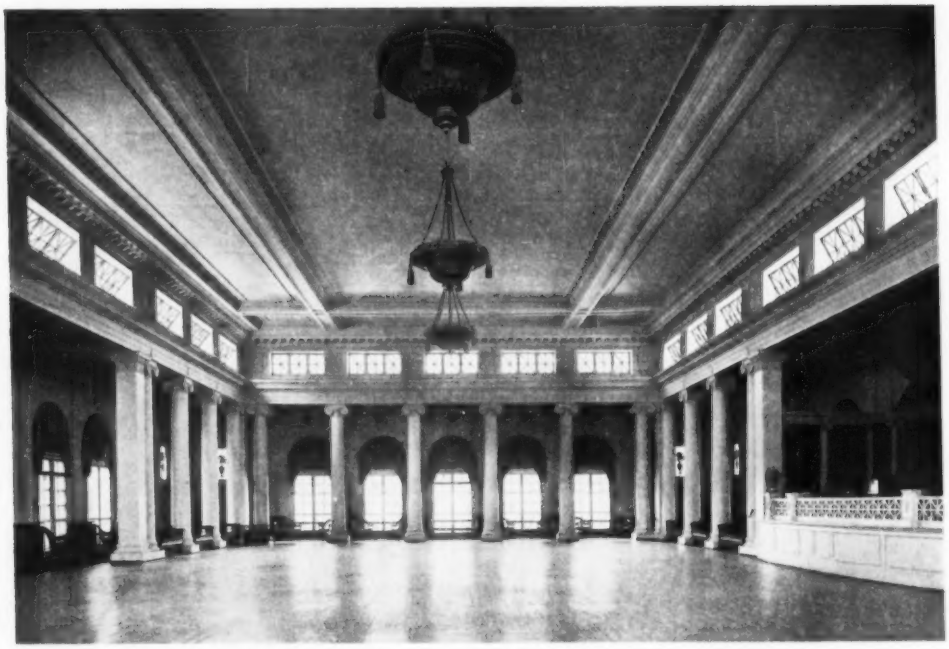


FIG. 18. GRAND BALLROOM—SOUTH SHORE COUNTRY CLUB, CHICAGO.
Marshall & Fox, Architects.

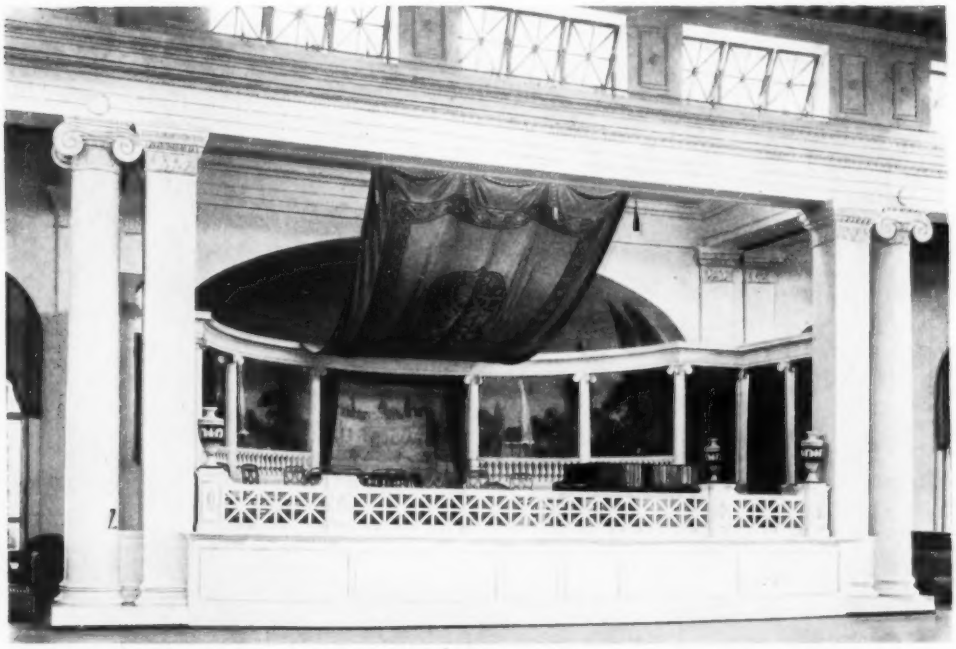


FIG. 19. ORCHESTRA AND STAGE IN BALLROOM—SOUTH SHORE COUNTRY CLUB, CHICAGO.
Marshall & Fox, Architects.

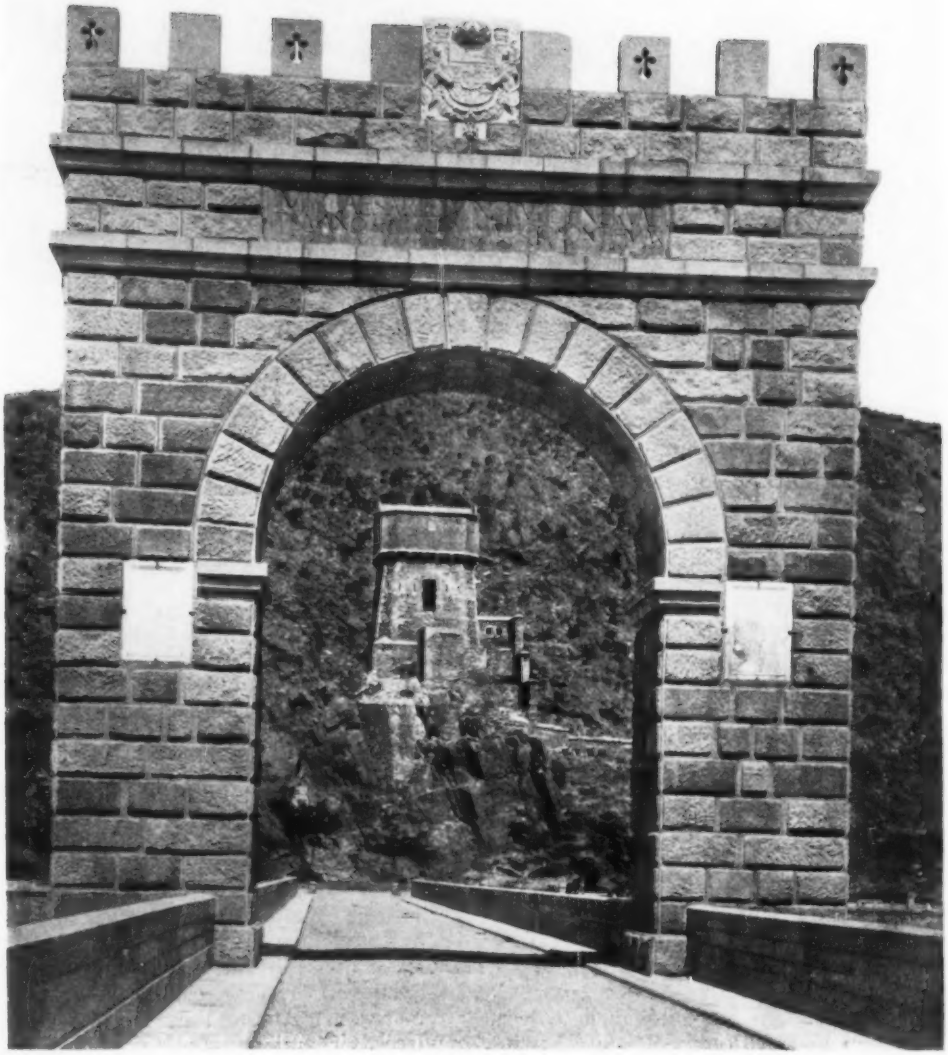
buffet and smoking room, and on the south side is the card room. The billiard room, writing room and library are on the mezzanine floor. Above the mezzanine floor the main building is occupied by ninety sleeping chambers, arranged singly and *en suite*, each with a bath. These are occupied by members, and, in some instances, by members' families.

The basement is occupied by the kitchen and service departments and the refrigerating plant. The kitchen is immediately beneath the dining room and occupies a space of 87 by 145 feet. It is extended out under the terrace which surrounds the dining room, and is connected with the dining room by a system of ramps, there being no stairways between them. A broad corridor from the kitchen under the grand promenade extends the entire length of the building, connecting with other service rooms. At the last New Year's Eve party 2,300 diners were served simultaneously from these service rooms, tables being placed in the grand promenade as well as in the dining room. The entire main floor of the club house can be turned into one great dining room with a seating capacity of 3,000, and all the tables can be reached directly from the basement.

The drive to the club house enters the grounds at the southwest corner through an appropriate lodge. Passing around an oval flower garden, the house is approached through a covered porch. The entrance vestibule, as seen from the interior, is shown in Figure 9. Having crossed the grand promenade, the visitor looks through the fountain court (Fig. 10) into the solarium on the lake side (Fig. 11). Entering the solarium, he turns around and has another view of the fountain court in Figure 2. On the right in this illustration is the entrance to the men's buffet, on entering which he has the view shown in Figure 12. He can pass out through another door to the grand promenade. Figure 13 is a general view of the grand dining room. On leaving the dining room through the great door shown at the left in Figure 13, he returns to the grand promenade through the north section illustrated in Figure 14, and has a view of its entire length, 338 feet, to the entrance of the ballroom, at the south end of the building. Having descended a few steps at the south end of the grand promenade and entered the ballroom, he turns around and has the beautiful perspective looking back through the promenade shown in Figure 17. This I conceive to be the most beautiful view in the building. Figure 18 is a perspective view of the ballroom, looking east. Its classic details, designed several years before the new building was erected, are in marked contrast with the informal and purely festive character of the new parts of the building. The orchestra and stage, shown in Figure 19, continue the classic motive; but the splendid silk tapestry suspended over the stage repeats the festive motive of the grand promenade. It is a piece of embroidery and appliqué work that accentuates the Ionic screen and the wall frescoes behind it.

The exterior of this building does not strive for effect through applied ornament. It is merely a building of good proportions, eminently suitable for its purposes. It screens and, by contrast, accentuates that other effect produced by the cheerful decorations of the interior. This is as it should be. The building stands on an exposed site on the shore of Lake Michigan, where it must combat the storms of winter. It is not a country club for summer, but for all the year, easily accessible to urban residents. More than this, it is a family club, for the wives and sons and daughters of its members as much as for themselves; and it is safe to say that, in summer at least, it is frequented more by women than by men. The club holds great functions at all times in the year, each appropriate to the season. Among these are the annual horse fair and country fair, which are conducted in temporary pavilions. For summer sports it has its bathing beaches, its trap shooting lodge and its yacht harbor. Family gatherings, dances and dinners are held throughout the year.

Restful, cheerful, appropriate to its purposes, the South Shore Country Club is an admirable example of festive architecture, executed in a way that elicits genuine admiration.



FORTIFIED ARCH OVER THE ROMAN BRIDGE AT ALCANTARA, NEAR THE PORTUGUESE FRONTIER.

ROMAN BRIDGE WITH FORTIFIED GATE, AT ALCANTARA. BUILT 103 A. D.

The Bridges of Spain

by

Arthur Byne

GIVEN the physical characteristics of the Spanish Peninsula—unusually deep, narrow gorges where rivers rush between high mountains, and unusually broad, shallow river-beds meandering across plains—and one will see that bridges must have been an important problem from the earliest civilization. The country is an arid one; its rivers generally dry; yet nowhere can water pile up more torrentially in the brief rainy period. In the gorge of the Tagus, near the Portuguese border, the usual depth of the water is thirty-seven feet; in flood time it amounts to one hundred and eighty. This is but one of many such jumps. Roman, Moorish, and Spanish engineers have successively grappled with their bridge problem; and the result is that Spain contains the most impressive bridges to be met with in Europe. Surely these are the survival of fitness; for not only has Nature herself repeatedly tried to wreck them, but they have been the prey of more invading, wrathful armies than any other European land has had to reckon with. Mighty erections, scarred by repeated buffetings, and surrounded, most of them, by a sublimely desolate landscape, they are among Spain's most interesting monuments.

Many of them are original Roman structures; many others are rebuilt on Roman foundations; a very few are modern (meaning sixteenth and seventeenth century) but following Roman prototypes; for, though Spanish architects never turned to the wealth of classic buildings in the Peninsula for inspiration, Spanish engineers always turned to the

ROMAN BRIDGE OVER THE RIVER TORMES, AT SALAMANCA.

massive prow-shaped piers with which the Romans always met the problem of a swift current. Indeed, in remote provinces like Estremadura and Leon, Rome still endures in the form of these massive bridges and—in the most popular jokes among the inhabitants.

Even the Moors, never noted for constructive ability, acquired the knack of building the Roman type of bridge; in several cases on old Roman foundations dating from the second or third century, like the Alcántara at Toledo. But in no instance have the imitators built as impressively, or as well, as their masters. Their work is constantly crumbling and needing repairs. The stones they used, often comparatively small, are held in place only by the adhesion of the cement and the grace of God. The Romans trusted to neither, but depended solely on their arch forms and bronze dowels, just as they did in building their huge aqueducts at Segovia and Tarragona.

Broadly speaking, there are but two types of bridge in Spain, both determined by the topography of the surroundings. The more impressive is the one of few, unequal arches and great height, spanning a rocky chasm. This is best represented by the famous Roman bridge at Alcántara—not to be confused with the Alcántara Bridge at Toledo; both have the same etymology: the Moorish *al*=the, and *kantara*=bridge; both span the Tagus, and both are of the lofty, few-arched type; but they happen to be some three hundred miles, as well as some ten centuries, apart.

Opposed to this type is the long, low structure of many equal sized arches striding across an unusually broad riverbed that is often absolutely bare in summer, but carrying a wide expanse of water in spring. This type is seen at its best at Salamanca, Córdova, and Mérida. Whatever impressiveness these examples may lack in height is made up in their interminable perspective of low arches. Indeed, the very monotony of these would alone command attention, bringing forcibly to mind those earlier structures that stalk for mile after mile across the Roman Campagna.

To reach one of the earliest and most famous examples of the first mentioned

type, one goes by train to Arroya de Malpartido on the Madrid-Lisbon line, thence by diligence (which has no particular schedule) to Alcántara, a drive of about thirty miles. The town in itself is quaint enough to be worth a visit; furthermore, having been the seat of the Knightly Order of Alcántara, it contains some beautiful churches and the finely sculptured tombs of the Grand Masters; but its great sight is the Roman Bridge which strides across the Tagus in six majestic arches. It is six hundred and seventeen feet long, twenty-six feet wide; the middle arches have a span of fifty feet, and their piers a height of one hundred and ninety feet. Above one of these, that is, in the middle of the structure, rises that frequent feature of Roman bridges, a fortified gateway, which adds another forty-three feet of height to the one hundred and ninety foot pier. Granite only was used for the whole—granite laid up without mortar; granite whose stern weathered face makes an almost startling harmony with the barren, unfriendly landscape.

In Roman days this was the province of Lusitania, and eleven Lusitanian communities furnished the money to build the bridge in 103 A. D. Until 1214 it stood intact; then the Moors in wartime took away sixty stones of the smallest arch on the left side of the river—a gap which remained until 1543, when it was repaired from the original quarries more than forty kilometers away. The colossal bridge suffered no further damage till Spain herself had to destroy its second arch on the right side to keep out a Portuguese army. This was repaired by Charles III in 1762. Spain it was again, or rather Spain with her allies, the Portuguese and English, who was forced to inflict the next wound, when French invaders were about to march over it in 1809. The same second arch on the right bank was dynamited. In 1819 it was temporarily repaired by wood and later, in 1860, by stone.

Obviously the strength of any arched structure depends on its continuity and on the integrity of its end abutments. To have been left for years deprived of these was a cruel test. Yet, as the Alcántara Bridge stands to-day, hardly a trace of these vicissitudes is discernible. It still looks as mighty as when its builders placed their inscription to the effect that the work was ordered by the Emperor Trajan in the year 103. No description of how this and similar bridges at Orense and Toledo were built has ever been found, and engineers are left to conjecture for themselves on how the centering was managed. What a find a wooden arch truss dating from Roman days would be! The likeliest solution is that the centering was built straight up from the ground and the entire arch-space used for bracing; but even this was no simple task, for where arches are largest and the centering correspondingly more elaborate and difficult to construct river beds have water in them all year round; also arches had to be expeditiously built, for no scaffolding could withstand the oft-recurring floods. To realize this, one has only to see the Tagus in flood season as it piles up in the Alcántara gorge, where that ancient Roman bridge, which has been withstanding such onslaughts for some two thousand years, fills the heart with reverence for venerable masonry.

Owing to the proportions of the Alcántara Bridge and the way it is hemmed in by the lofty river banks, it is almost impossible to get a good photograph; but near it is a quantity of accessible Roman architecture which is worth picturing and studying.

At Mérida, comparatively near Alcántara (but the railroad connections are most unsatisfactory) is another imposing ancient bridge. This time it is the broad and generally sluggish Guadiana, and not the narrow rushing Tagus, that taxed the ingenuity of Roman builders; taxed their ingenuity because the great breadth of the river bed and the lowness of the foothills beyond required an extraordinary number of arches (sixty-four of them) and a correspondingly great number of piers—a veritable wall of abutments. To overcome this weakness—for paradoxical though it sounds, the very strength became a weakness—a solution both practical and architectural was reached. While maintaining the spread of the pier abutments the builder intro-

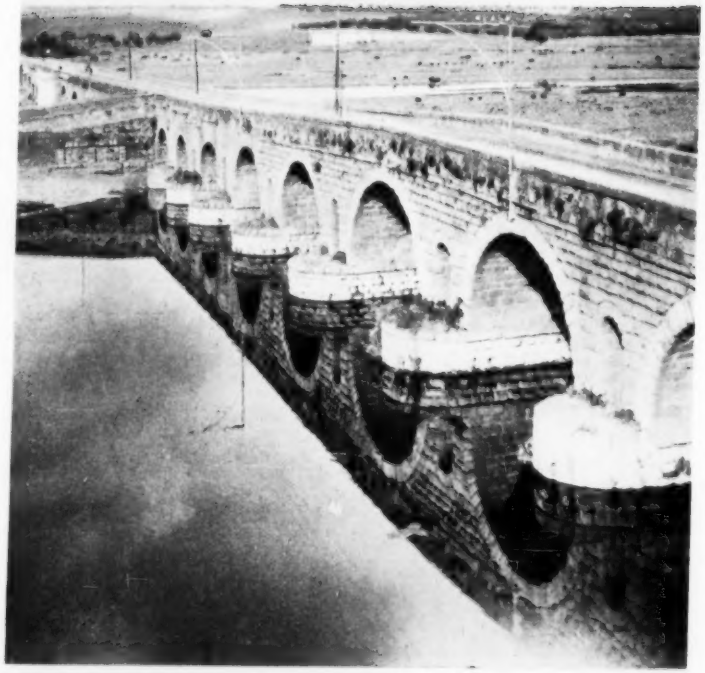
THE MOORISH BRIDGE OVER THE GUADALQUIVIR, AT CORDOVA, BUILT ON ROMAN FOUNDATIONS. THE MASSIVE *TETE-DE-PONT* STANDS AT THE BEGINNING OF THE ROAD TO SEVILLE.

duced above them, at a point where solid masonry is no longer necessary, a small subsidiary arch between the main arches, thus relieving much of the water pressure. This happy solution is as picturesque as it is practical. On a sandbank to the southeast is a further protection in the shape of a Roman structure which splits the current and thus prevents its beating with full fury against the center of the bridge.

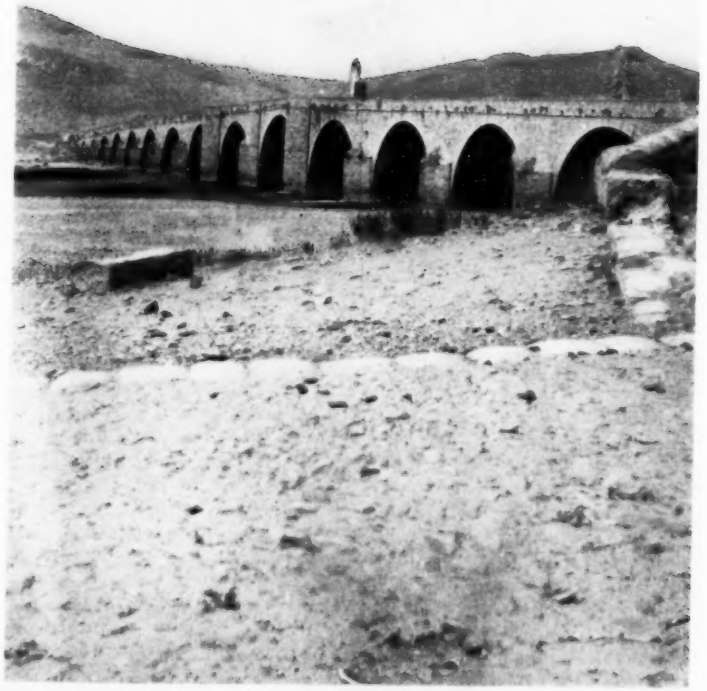
The town of Mérida, founded 23 B. C., grew to be so wealthy and important that it was referred to as the "Spanish Rome." As capital of Lusitania, one of the three great provinces into which Roman Spain was divided, Mérida was filled with large public buildings whose grand ruins bring many a traveler to-day to this remote spot.

The Guadiana, in those days when Mérida was a metropolis, was navigable; what is now merely a sand bank amidstreams was an island filled with docks and warehouses to receive the merchandise brought from other lands. "No man on earth can describe the wonders of Mérida," wrote a Moorish historian after his people had conquered the city in 713. This was probably not so exaggerated as it sounds, for in addition to its Roman buildings, the Visigoths had given it, according to the "Chronicle of the Cid," a strong wall with eighty-four gates and three thousand towers (which figure a modern is at liberty to question).

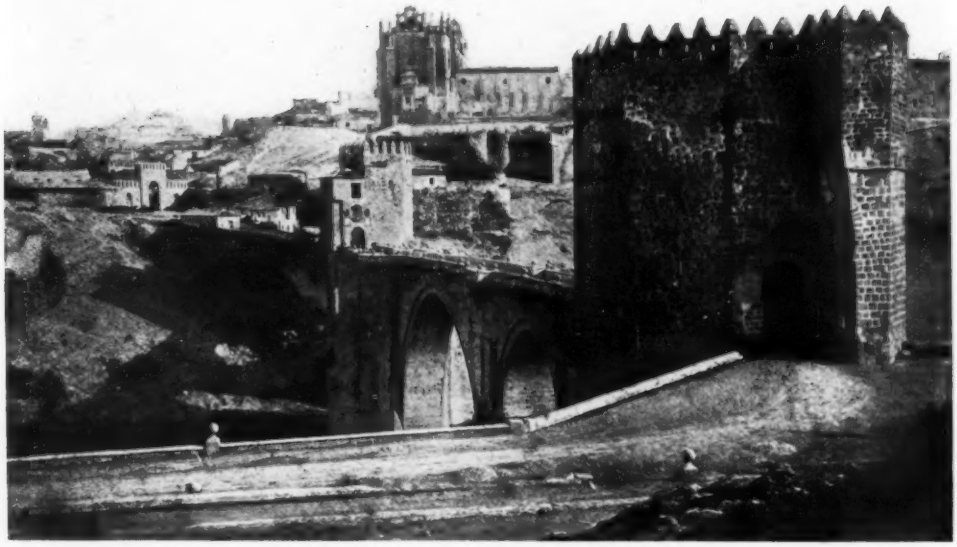
Of what remains of all this grandeur the magnificent Puente Romano, built by Emperor Augustus, alone stands entire Not, however, with its Roman entirety, for it, like its Alcántara neighbor, fell upon evil times. In Gothic days a flood swept away nearly all the pentagonal island and its structures, including the bridge piers resting on it. Sala, Visigothic Duke of Toledo, repaired these last in 686. Nearly a thousand years later Sala's five island arches were again demolished by floods. Mérida and all towns within fifty leagues defrayed the expense of rebuilding these in 1610. In 1812, when Wellington was besieging the French in Badajoz, on the nearby Portuguese border, two arches were blown up



PART OF THE ROMAN BRIDGE OF SIXTY-FOUR ARCHES AT MERIDA.

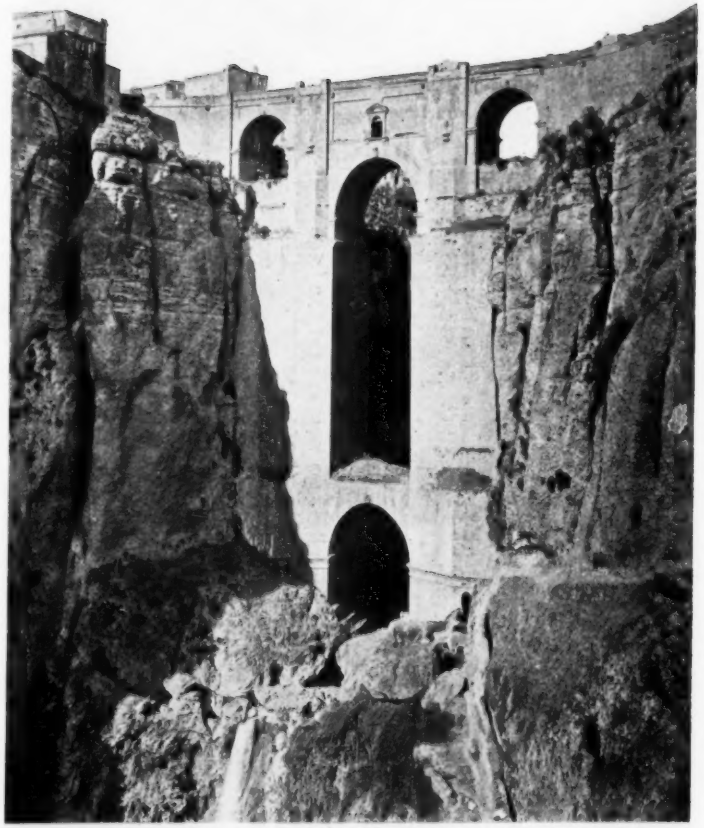


THE BRIDGE AT MEDELLÍN, WHERE CORTÉS, THE CONQUEROR OF MEXICO, WAS BORN. BUILT IN 1636 ON ROMAN FOUNDATIONS.

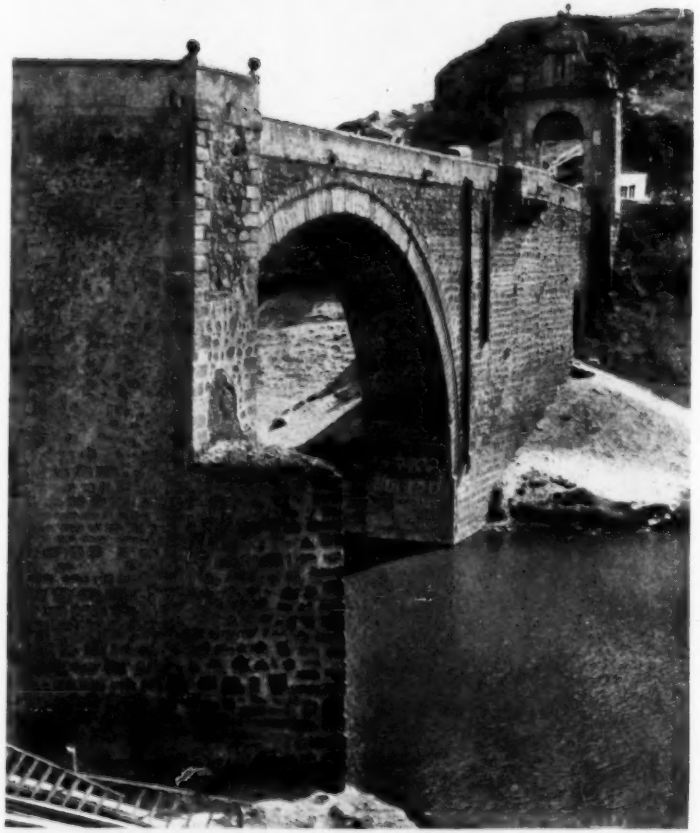


BRIDGE OF SAN MARTIN, AT TOLEDO. BUILT IN 1212.

BRIDGE OF SAN MARTIN, LOOKING TOWARD THE PARCHED HILLS ACROSS THE TAGUS.



BRIDGE SPANNING THE IMPOSING TAJO, OR GORGE, WHICH DIVIDES THE CITY OF RONDA INTO TWO PARTS. LAST REBUILT IN 1761.



ALCÁNTARA BRIDGE, AT TOLEDO. MOORISH BUT REBUILT IN 1258. THE GATEWAY, CROWNED BY A SEVENTEENTH CENTURY TOP, STANDS AT THE BEGINNING OF THE ROAD TO ALCÁNTARA.

MEDIEVAL BRIDGE IN THE PROVINCE OF JAÉN, ANDALUSIA.

to prevent the enemy from getting into Andalusia. These were replaced by wood until 1833, when stone ones were built. The winters of 1860 and 1876 brought terrific floods that necessitated several new arches and general overhauling, all of which is hard to believe if one visits Mérida in summer when the Guadiana seems almost stagnant and shrunken to half its winter proportions.

Mérida Bridge is thirty-three feet high, twenty-one feet wide, and one-half mile long—an enduring monument of human skill and patience stretching away into an interminable perspective of bare pathless hills.

The two bridges just described do not begin to cover the Roman period, but are chosen as the best of two distinct types. Our illustrations will serve to further indicate the wealth of such structures left by that great building nation who occupied Spain from 205 B. C. till the Visigothic King Euric put an end to their weakened dominion in the fifth century A. D.

In medieval days, comprising Visigothic, Moorish, and Spanish rule successively, but few new bridges were added until the twelfth century, all energies being bent on keeping the Roman ones in repair. But with the Reconquest new efforts were put forth and no spot seemed too remote or too sparsely inhabited to receive this civilizing touch. Bridges erected in the very capital, Toledo, were no grander than the one that served the little far-away and never important town of Medellín in Estremadura. All show how thoroughly the Spanish engineer was impressed by classic work; and all, conforming to the topographical conditions already mentioned, follow the two main types conceived by the Romans.

Of the first, since we are again considering the gorge-enclosed Tagus, Toledo holds two admirable examples—the Puente Alcántara (on the old road to Alcántara) and the Puente San Martin. Than the former no subject in Spain has been more often photographed or painted; and deservedly, for with the swirling river beneath, and the city piled up beyond on its calcined rock, it is a striking sight that stirs every imagination. This picturesque bridge rests on Roman foun-

MEDIEVAL BRIDGE OF SAN JUAN DE LAS ABADESAS, AT THE FOOT OF THE PYRENEES.

dations. The Moors used these in their day, but what they built was mostly destroyed and what we see to-day dates mainly from 1258 and 1380. About its masonry there is nothing remarkable, the bridge being rather a *tour de force* in conception than in execution. It has only two arches, but these are very lofty, and, combined with the narrowness of the bridge (only seventeen feet) and the tall tower at each end, they seem to breathe the spirit of the great bridge builders of a thousand years before.

The five-arched San Martin, built a little earlier, in 1212, has more of the medieval aspect. Of its building the English architect, George Street, tells the following quaint story: "The builder, while the work was going on, perceived that as soon as the centering was removed the arches would fall. He confided his grief to his wife. She, with woman's wit, forthwith set fire to the centering and when the whole fell together it was attributed to the calamity of the fire. When the bridge had been successfully rebuilt she confessed her proceedings to Archbishop Tenorio, who, instead of making her husband pay the expenses, seems to have confined himself to complimenting him on the treasure he possessed in his wife."

The San Martin, with its vast pointed arches, the center one over one hundred feet in span; its huge spreading piers, the one nearest the town building out in seven gigantic steps; its corbeled balconies and turreted towers, satisfies every romantic requirement. Why, at a moment when round-arched Romanesque was in full swing in Spain, this bridge was built in Gothic style is a question. The greater strength of the former must have been known, but perhaps the fact that the steep sides of the Tagus form powerful natural rock buttresses for any bridge to spring from was supposed to offset the weakness of a two-centered arch. As to execution, its stonework is well designed and cut, and its roadbed is flagged instead of being of dirt, as in the Alcántara and many others. The only provision for the pedestrian is the corbeled balconies, where, while waiting for a score of pack mules to pass, he may enjoy wonderful views both up and down the Tagus.

PUENTE DE PIEDRA, OR STONE BRIDGE, OVER THE EBRO AT SARAGOSSA, DATING FROM 1447. THE CATHEDRAL OF EL PILAR BEYOND.

Of the medieval many-arched type, Medellin Bridge over the Guadiana is one of the most monumental. Here again the foundations are Roman; but as nothing of the original superstructure remains, the bridge is entirely of the seventeenth century in character. It is thirteen hundred and fifty feet long, twenty-three feet wide, and has twenty arches; in addition to the impressiveness which such dimensions give when carried out in grim granite, is the added effect of the ghastly loneliness and desertion that stretches far away on each bank of the river. This is the most sparsely inhabited part of Spain; and how the handful of hamlets within a radius of fifty leagues ever raised, as they did, the money to pay for this magnificent bridge is a problem in economics that I am unable to grapple with. This was collected in 1636 when Philip IV sent D. Juan de Villagoitia to rebuild a fallen structure which Ferdinand the Catholic had ordered; the Roman bridge having been long before demolished by the Arabs.

The pointed crown of the Medellin arch is slightly eased, and this effect is repeated in the whole composition where the bridge rises to a gentle crown at the middle. At this point stands an adornment with the arms of Spain and the commemorative inscription dated MDCXXXVI. The Don Juan de Villagoitia whom it records has left a marvelous bridge that should stand forever. He could have put no greater skill and energy into his task had it been in the center of the world's metropolis, to be used and admired by millions of people annually, instead of serving merely for the migratory herds of sheep that come down each winter from Leon to feed in Estremadura.

THE RIVER FRONT, ON THE COSSON.

THE CHÂTEAU OF LES GROTTEAUX

By FISKE KIMBALL

THE architect returning from Blois to Chambord, in days when travel in France was still possible, was but too likely to share the disappointment of Mr. Henry James in the vast but arid splendor he had just left. If he permited the lazy *cocher* to follow the shortest and least interesting road, he passed midway the little village of Husseau-sur Cosson. There, behind a shaded gate-lodge, is hidden an estate the very opposite of Chambord, which, if he but knew, would delight him with a beauty subtle and intimate. *"Le Château des Grotteaux,"* jerks the driver, *"On ne visite pas."* So the traveler goes by, unconscious that he has missed one of the most delicious morsels in Europe.

The château, dated 1620, comes from a unique time in the architectural history of France, the early years of the reign of Louis XIII. Peace and security were fully established; enclosures, towers and moats no longer necessary. Paris and the court had not yet become the sole dwelling place of society; to live on one's estate was not yet to live in exile. An ideal of sincere austerity and simplicity remained in certain quarters, the legacy of Protestantism and Henry IV. Under these conditions the country house in the modern sense—not castle, or palace, or villa, or grange—received its first expression, in France almost its only expression.

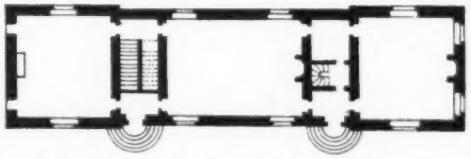
Even among the houses of the period Les Grotteaux is all but unique. Its small size, its immediate contact with nature, devoid of every vestige of formality—in which it resembles many houses of to-day—are the results of the exceptional personality of its owner and builder.

A plain oblong central block with two slightly projecting pavilions, each with its own steep roof, a few tall square windows with dormers over them, that is all —all, except the fine sense of proportion, the nice departures from obviousness, which fuse these simple elements into a composition of unusual unity and perfection. There is no longer the joyous exuberance of the Renaissance, with its elaboration of individual detail; but in its place have come moderation and consistence of general effect. The phrase

THE ENTRANCE FRONT—CHÂTEAU OF LES GROTTEAUX.

which Mr. Ward applies to the architecture of the time might well have been written with this building before his eyes: "Belief in law and order and conformity to reasoned canons, in clear, logical presentment and perfection of form, obtained by rigid self-criticism and elimination of the unessential."

It is such a building as this that makes us realize the *reductio ad absurdum* self-implied in the dogmas of Ruskin, who found that "the only admiration worth having attached itself wholly to the sculpture and color on the building," and that "every building whose excellence consists merely in the proportion of masses is to be considered as nothing more than an architectural doggerel, or rhyming exercise." No wonder he was driven to say: "The fact is, there are only two arts possible to the human race, sculpture and painting." The serene presence of such works as this obscure French house reasserts the existence of a pure art of architecture, which he had sought to abolish by definition, on a complete equality with the other arts. Whatever the next swing of the pendulum may bring, we of to-day are convinced, with Mr. Reginald Blomfield, "that architecture is an art with its own limits and ideals, not dependent on sculpture and painting as the later mediaevalists had made it, but complete within itself and capable of realizing its full effect by simple qualities of line, mass and proportion."



PLAN OF THE CHÂTEAU, FROM REYNAUD.

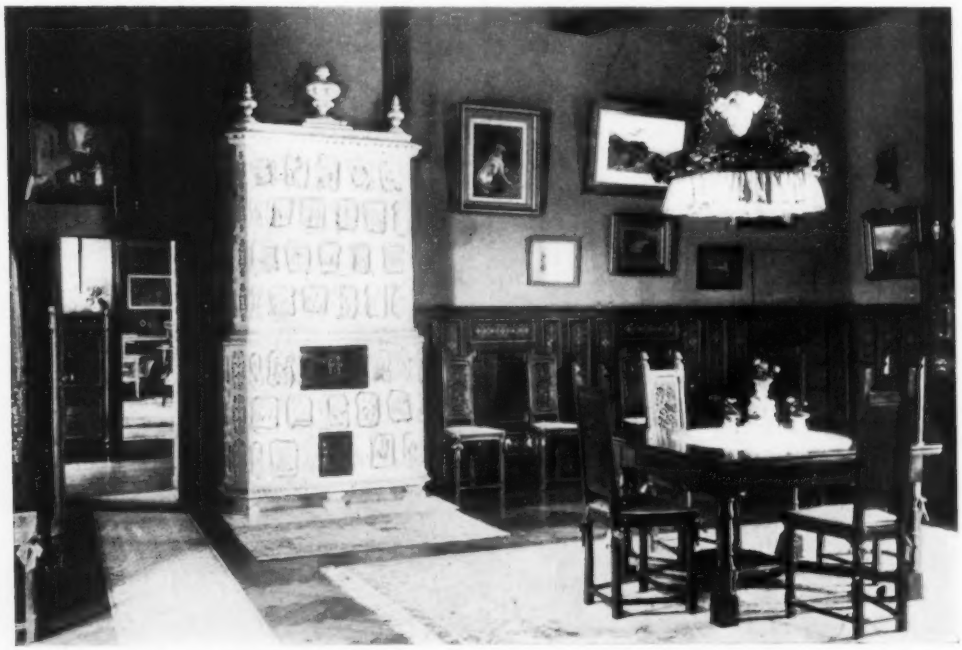
The house shows, too, that it is not only in works of classical bombast, where Mr. Blomfield has so often unearthed them, that these effects are to be found. Here is little that might not serve as an illustration for Guadet, or even for Viollet-le-Duc, in its frank expression of the simplest functions. The plastered wall with corners and openings strengthened with quoins of white stone, the light cornice, steep roof, and tall plain chimneys, are nothing but the most utilitarian elements of building. The only vestiges of ornament, the enframements of doors and niche, the pediments of the dormers, are almost immaterial to the charm of the ensemble. What is classic here is not the forms, but the spirit of breadth, dignity and repose.

The artistry which has drawn an effect so exquisite from means so simple is not as unconscious as might at first appear. There is a good deal of freedom in the choice of heights for the cornices and strings, a subtlety in the expression of the little hallways by the use of quoining alone, that show the builder realized that *architecture raisonée* is not tied hand and foot by utility and structure. The service wing, which might have unbalanced the composition, is cleverly detached from it by a covering of treillage. The variety secured between the two façades by minute changes which transfer the emphasis from the ends to the middle, is another proof of high artistic powers. A final refinement might escape even the most slavish attempt at reproduction—the displacement of the pavilion windows of both front and rear, from the center of the pavilions toward the center of the building. Léonce Reynaud, who chose Les Grotteaux with Chenonceaux as his examples of French manors, missed this powerful device altogether, and gave his drawings with the windows squarely on axis. As the interior of each pavilion is a single room, there can be no question that the irregularity was introduced solely for a more unified exterior which should have but one true axis of symmetry instead of three. The displacement in front is over a foot, in the rear it is more than three feet. In this difference, too, the reason is not far to seek, though the boldness denotes a master. The *parti* adopted for the rear façade—emphasis on the middle in spite of pavilions close at hand—was counter to all ordinary canons and almost foredoomed to failure. Moving the windows so far completely destroyed the axis of the pavilions and left a piquant composition wholly dependent on its center.

The internal arrangement is clearly betrayed at first glance: three rooms, all running the full depth of the house, separated by narrow hallways containing the entrances and stairs; four bedrooms above, with dressing rooms between. Paneled wainscot, beamed ceiling, tall windows, and painted shutters give an air of stateliness and lingering mediaevalism. The dining room is the most interesting, with its fine Flemish tapestry and furniture from Chambord. Here is the original porcelain stove of Marshal Saxe, of which visitors now see a copy in the palace. Most beautiful, however, is a work modern in date, but mediaeval in its spirit and craftsmanship—the wreathed iron crown which hangs above the table, made for a former occupant by

THE RIVER FRONT—CHÂTEAU OF LES GROTTEAUX.

THE DINING HALL—CHÂTEAU OF LES GROTTEAUX.



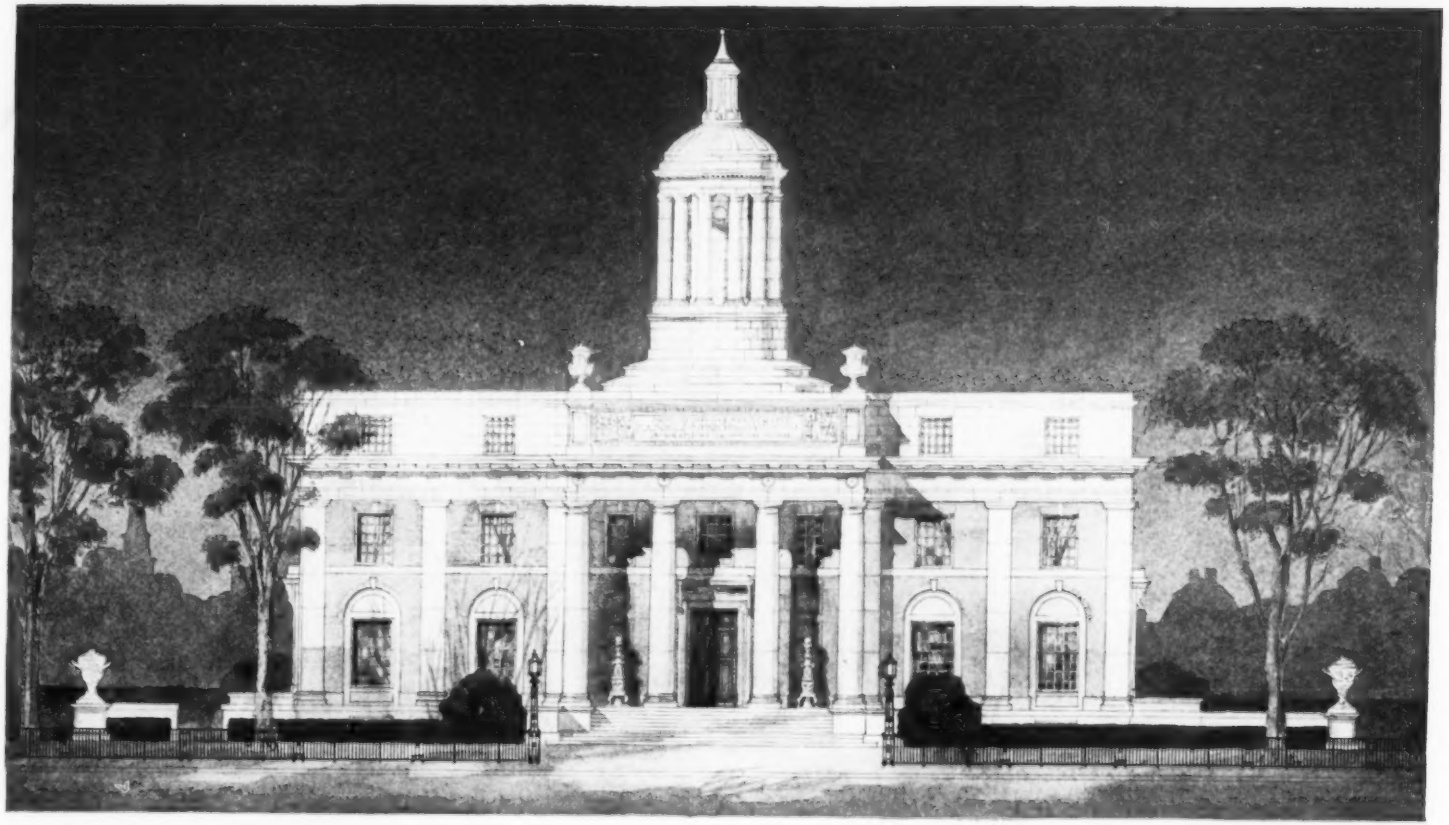
THE DINING HALL, WITH THE STOVE OF MARSHAL SAXE—CHÂTEAU OF LES GROTTEAUX.

THE SALON—CHATEAU OF LES GROTTEAUX.

a humble Rhenish smith still worthy of the old traditions of his art. The salon is now chiefly remarkable for its chimney-piece, richly carved in white stone, and for the arabesques of its ceiling. From one looks down the portrait of Guillaume Ribier, modest and chivalrous, the first owner of the château; from the other, the symbols and mottoes which express his life. One's curiosity cannot fail to be aroused concerning the man to whom report ascribes not only the execution but also the design of this *chef d'oeuvre* of refined beauty.

To satisfy it one cannot do better, perhaps, than to turn to the enthusiastic pages of the Comte de Salaberry in the *Memoires* of the Société Academique de Blois. "The little château of Les Grotteaux," he says, "was the seat of the wise, the good, the virtuous Guillaume Ribier, retired privy councillor, witness and actor at the States General of 1614. Guillaume Ribier made himself admired in that assembly by his vigor of mind, and obtained from the King Louis XIII and from the queen-mother all that he demanded for his country. The title of privy councillor, for which he did not ask, was given him out of respect. Marie de Medici during her retreat or exile at Blois took his counsels and had him offered the post of secretary, which he refused through modesty. Finally Cardinal Richelieu, after the taking of La Rochelle, on his passage through Blois, proposed that he should follow the court and serve the king, in his confidence, promising him elevation sure and high. Ribier still refused. . . . The character, the manners, the studies, the piety, the fidelity, the whole life of Guillaume Ribier are historically in accord with the devices with which he loved to surround himself in his dwelling."

Among the inscriptions quoted from these devices is one which we may heartily echo. It is a prayer of the old philosopher that the château may remain as long as the Cosson shall flow at its feet.



FRONT ELEVATION—MUNICIPAL BUILDING, PLAINFIELD, N. J. LAURENCE F. PECK AND WILLIAM LAWRENCE BOTTOMLEY, ASSOCIATE ARCHITECTS.

The Municipal Building at Plainfield, N. J.

Laurence F Peck and
William Lawrence Bottomley
Associate Architects

THE winning competitive design, by Laurence F. Peck and William Lawrence Bottomley, for the Municipal Building at Plainfield, N. J., is interesting as an adaptation of American tradition in architecture, and may best be understood by first glancing at the particular conditions which dictated the design.

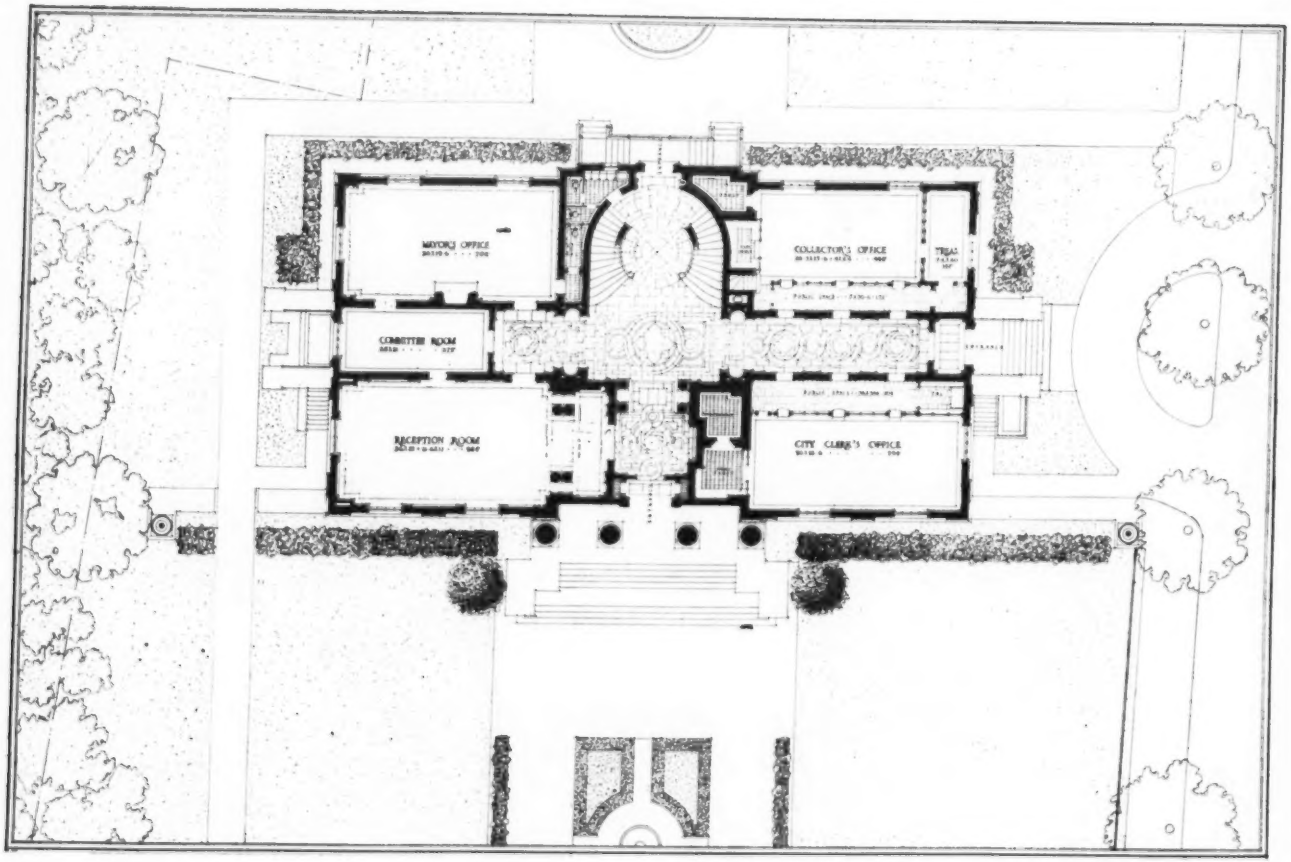
That any structure should make the most of the site provided for it is always a first consideration, and in this case has largely determined the general lines of the building. The site is a well chosen plot of land at the corner of Watchung avenue and Sixth street, shaded by a few fine trees and well open toward the southwest, but partly obscured from the direction of the station by small frame structures built close to the sidewalk. A study of these factors shows that the building should present a more important front to the avenue than to the street, and yet be in no way slighted at either end, and that it should be placed far enough from the avenue to assure ample approaches and lawns in front of the main entrance, without permitting it to be hidden by the adjoining houses.

The building is therefore planned to be twice as long as it is wide and to be situated a little to the rear of the centre of the property, with entrances, front and rear, giving circulation of air and light and a view of the grounds as one enters from either side. There will be an old-fashioned walk—flanked by two large trees—leading across the lawns to the steps of the portico, and a drive to the entrance on the opposite side; and surrounding the property will be a low Colonial iron fence with lamp posts at intervals.

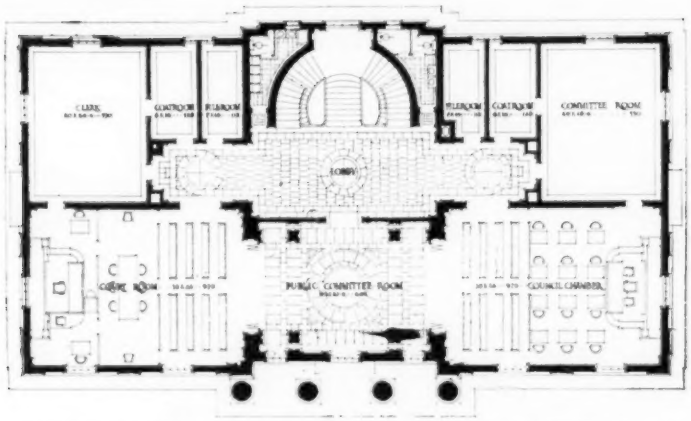
The portico, the cupola, the Colonial brickwork, with limestone pilasters and window trim and cornice, will be Colonial in scheme and in refinement, but will have less of conservatism and more of vigor and freedom in treatment than would be possible in an archeological adherence to precedent; while the details of moldings and decoration will be handled in the same way, and the limestone, instead of having a hard white surface, will be what is known as "American travertine," of light buff color with a slightly pitted surface.

Responsible also for the general scheme and outline of the building were the requirements of the two principal floors and the necessity of allowing for future additions. The various city departments will be comfortably housed for years to come; but the possibility of an enlarged building has nevertheless been provided for, and the present structure is so designed that it will be helped rather than marred by the addition of wings. The interior arrangement is such that no structural alteration will have to be made.

A maximum of accommodation for a minimum of expense has dictated a very simple treatment for the interior. The entrance vestibule will give onto a lobby with the Mayor's suite on the left and the City Clerk, Collector and Treasurer on the right; opposite will be a sweeping circular stair from top to bottom of the building. The Mayor's suite will consist of a library in front and a private office in the rear, connected by a small committee room between. Both Collector and City Clerk will have vaults, private stairs to the Assessor's and Street Commissioner's offices below, and a public space entered from the lobby.



PLAN OF GROUNDS AND FIRST FLOOR—MUNICIPAL BUILDING, PLAINFIELD, N. J. LAURENCE F. PECK AND WILLIAM LAWRENCE BOTTOMLEY, ASSOCIATE ARCHITECTS.

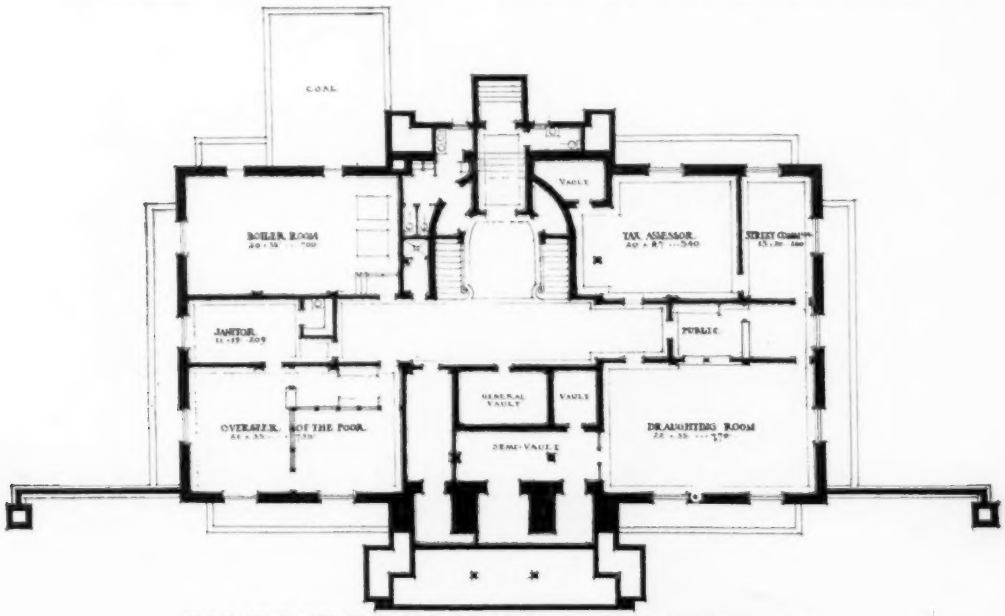


PLAN OF SECOND FLOOR—MUNICIPAL BUILDING, PLAINFIELD, N. J.
Laurence F. Peck and William Lawrence Bottomley, Associate Architects.

On the second floor will be a council chamber and a courtroom, equal in size, each occupying an end of the building. Between the two will be a large public committee room, so arranged that it can be thrown into either the chamber or the courtroom and used for overflow. On this floor there will also be a clerks' room, a committee room, and file- and coat rooms, telephone booths, etc.

The basement, which will have windows from the ceiling to three feet above the floor, will contain offices for the Assessor, the Street Commissioner, the Overseer of the Poor, the boiler and janitor's rooms, storage and vault space, showers for employes, etc. The top floor will be given over in part to the Health Department and to city planning, leaving considerable space unassigned.

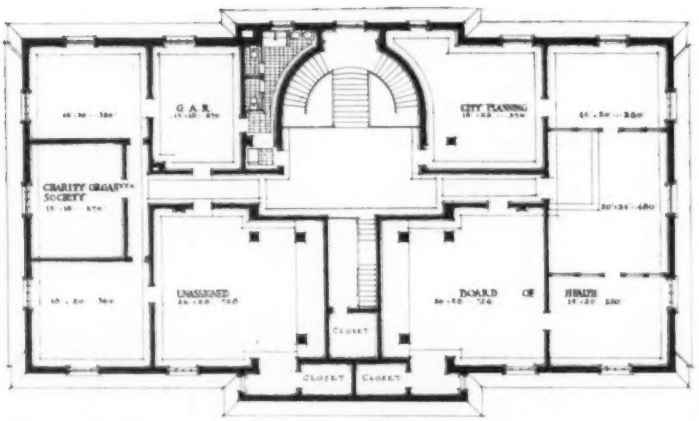
In general, the floors will be finished in terrazzo in the halls and in wood in



PLAN OF BASEMENT—MUNICIPAL BUILDING, PLAINFIELD, N. J.
Laurence F. Peck and William Lawrence Bottomley, Associate Architects.

the various rooms. The walls throughout will be painted. A simple architectural treatment will be given the walls of the first and second floor halls, the Mayor's suite, and the council chamber and courtroom, with such decorative effect as can be obtained by the use of color, and by bookcases in the Mayor's library, a large fireplace in his private office, and the necessary fixed furniture in the council chamber and the courtroom.

The construction will be thoroughly fireproof and planned with regard to the least expensive methods of obtaining lasting results and avoiding deterioration and charges for upkeep and management. In consequence, reinforced concrete will be used wherever possible in place of steel, such vaults as need to be burglar-proof will be reinforced with chrome steel bars instead of the usual laminated steel, a scheme of natural ventilation has been devised to overcome the expense of installation and upkeep of a ventilating system, and the arrangement of rooms and entrances has been worked out so that they may be supervised by a minimum of employes.



PLAN OF THIRD FLOOR—MUNICIPAL BUILDING, PLAINFIELD, N. J.
Laurence F. Peck and William Lawrence Bottomley, Associate Architects.

CHVRCH PLANNING IN THE VNITED STATES

Part IV

Sunday School and Audience Hall on Separate Levels

By Richard Franz Bach

THERE remains, then, the other alternative of considering the Sunday School an entirely separate department and its meeting place a distinct room or hall, isolated or set apart from the audience room and not even connected with it on a single level by means of passages, as was seen in certain of the examples illustrated in the preceding paper. This implies the disposition of the whole building in two levels. The Sunday School in this arrangement logically finds its place below the main auditorium (Figs. 1, 2, 3, 4, 5, 6, 7.) This arrangement suggests itself obviously for reasons of economy in land or in construction, but does not avoid certain serious difficulties attendant upon the difference in the type of use to which both levels in such a building are put. The chief difficulty encountered in this connection is that of lighting. The Sunday School requires plentiful light, while its position under the audience hall, that is to say, in a basement, usually restricts it to low windows. The necessary glass area must then be gained by widening the windows of the basement story, to make up in width the loss in height, with the resultant discrepancy between window dispositions in the upper and lower stories of the building. Furthermore, in the plan of limited size, the greater the window space the less the remaining wall space, which —aesthetically, if not structurally—must serve to support the taller wall areas above. This difficulty has led to great dissatisfaction with the two-story plan, although it has still found frequent application through stress of financial or space limitations, and especially in churches located in crowded cities. We must credit the advance in the understanding of the needs and proper interpretation of the scope of the Sunday School for the gradual abandonment of the double level scheme in which the Sunday School must be relegated to a basement story. A constantly increasing number of churches are now built in which the double level is retained, but the space beneath the church proper is occupied by other activities, not requiring daylight and usually not involving the presence of children except at play. In country or suburban churches, the two-story plan has certain advantages for the builders and congregation alike, if the site is on sloping ground, so that on one side at least greater height is available for the under-structure, thus granting the lower windows additional length, and achieving thereby a corresponding appearance of firmer support for the upper church or audience hall.

If, on the other hand, the lower story is given ample window height, a double difficulty follows. First, in the exterior there will be a disagreement between the two levels as to their relative importance, concerning which the design should otherwise leave no doubt. Such a consideration might not be allowed to weigh so heavily in the case of a building of an-

other type, especially if it be of more decidedly utilitarian purpose, but the persistent and intimate relation between the fine arts and the church through so many centuries has made practically mandatory various important but often purely aesthetic considerations, not to mention the ineradicable effects of rooted tradition, which the use of any style closely associated with the church in the past

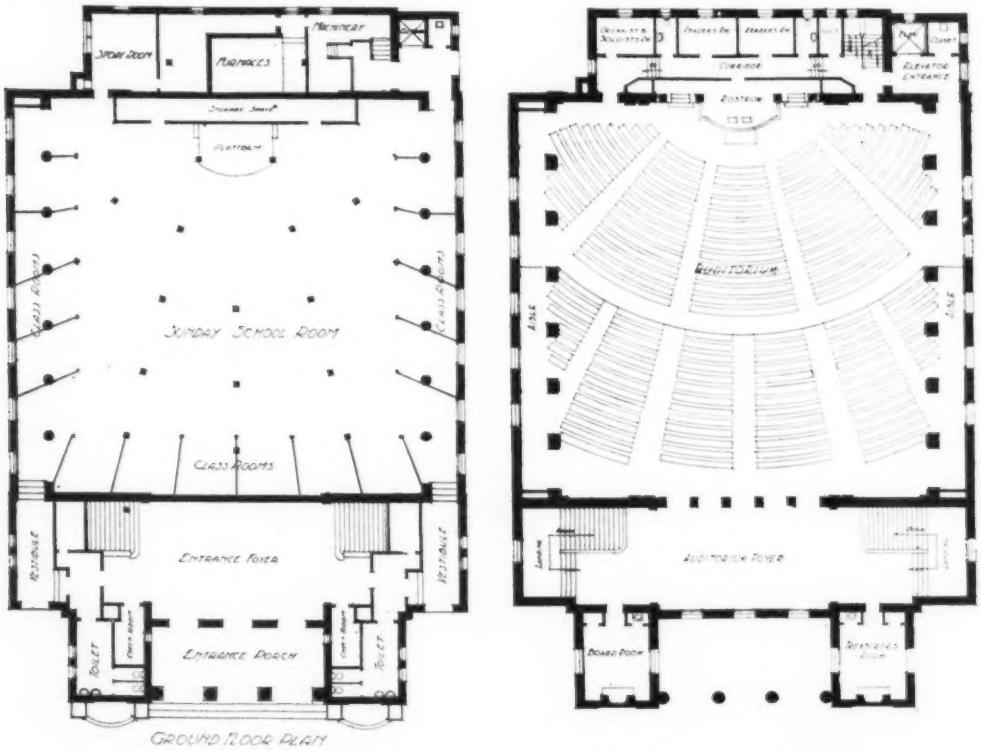
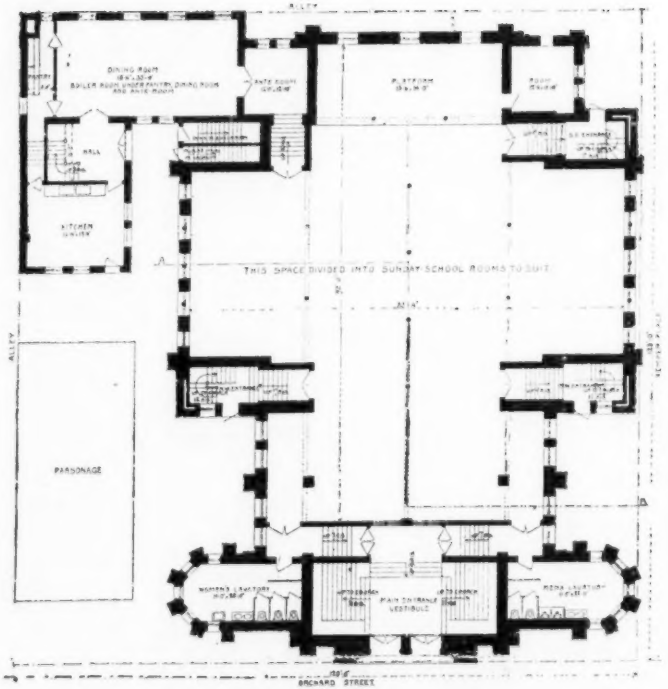
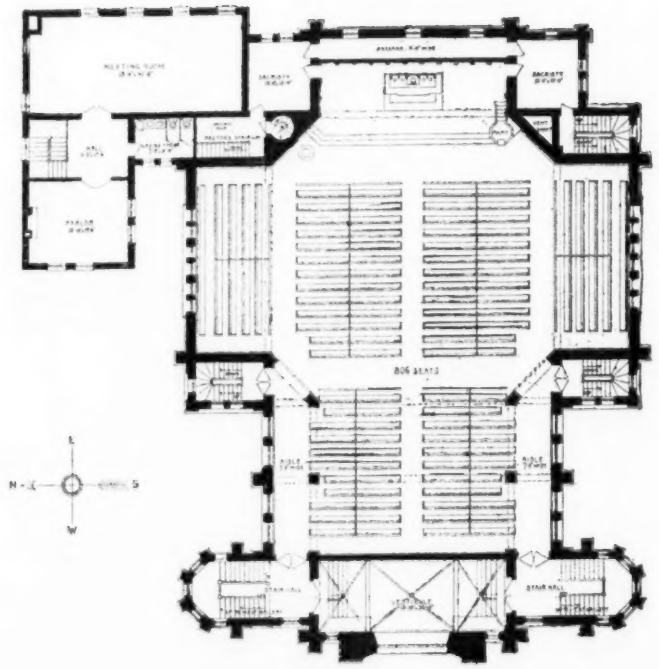


FIG. 1. FIRST CHURCH OF CHRIST SCIENTIST, LONG BEACH, CAL.
Elmer Grey, Architect.

will cause to assert themselves. Should we be able to avoid this exterior difficulty in design we should yet have to reckon with that of interior facility of access to the main auditorium, which would then be placed so high as to require too great stairway approach, with consequent inconvenience to worshippers. This would also entail more expensive construction and make greater demands upon original plan area, in most cases already overtaxed. It would, in addition, necessitate the use of the stairway by all persons entering either level of the building. The two types of service would therefore conflict if they should occur at the same time, to the extent that there would be overcrowding at the exits. Stairways in such double level churches are rarely of such proportions as to alleviate even in a small degree the confusion and discomfort attendant upon this crowding. This obstacle would also operate to render unimportant the design of the stairway approach to the church, which likewise would encroach upon valuable land, and therefore the approach is prone to be out of accord with the interior to which it leads. There are numberless examples of this fault, in most cases unavoidable, for reasons already mentioned. The only entirely adequate remedy from the Sunday School point of view would be, of course, to grant this part of the edifice



Plan of Basement.



Plan of Church Floor.

FIG. 2. ST. PAUL'S EVANGELICAL LUTHERAN CHURCH, CHICAGO.
Hill & Woltersdorf, Architects.

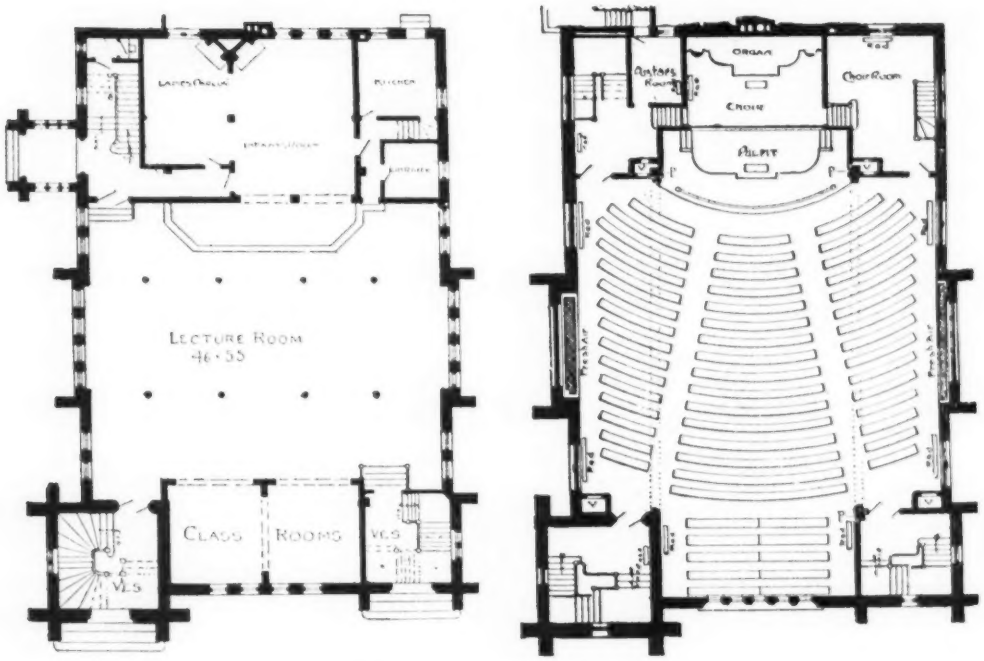


FIG. 3. CHRIST M. E. CHURCH, DENVER, COLO.
Kidder & Humphreys, Architects.

such height as it might require and then to carry the remainder of the building up to whatever height it in turn might require; the congregation must then be reconciled to a constant climbing of stairways, but would have the consolation that the work of the Sunday School, in many respects more important than its own, had been adequately provided for. There is, to be sure, the possibility of dividing exactly or approximately in half the height of the Sunday School space, so that the level of the street becomes also the level of a stair landing from which one travels an equal number of steps up or down to the audience hall or Sunday School room respectively. This expedient has been frequently resorted to, but can rarely be said to be entirely satisfactory. The lighting of the lower story is practically never of the desired intensity, unless a very wide areaway all around is available.

Beyond the purely exceptional case of the church edifice blocked in between city buildings, occupying as much of its lot as the law will allow, and making no pretense at anything but entrance façade design, only few legitimate opportunities would present themselves of placing the Sunday School level above that of the audience hall. Such arrangement has found use in some city churches, which have been built in isolated cases to three or four stories, with offices, residence quarters and other rooms in the upper floors, not to mention spacious accommodations for a number of outside activities of the congregation, meeting rooms, and the like. In most examples of this kind, however, the church motive as an integral feature in the exterior and usually also in the plan must be sacrificed to the exigencies of collateral service in allied fields and possibly also to the value of land, and it becomes but a subordinate hall with not even the quantum of dignity of its own expression which is granted in university or hospital chapels when these are built into the fabric of group plans.

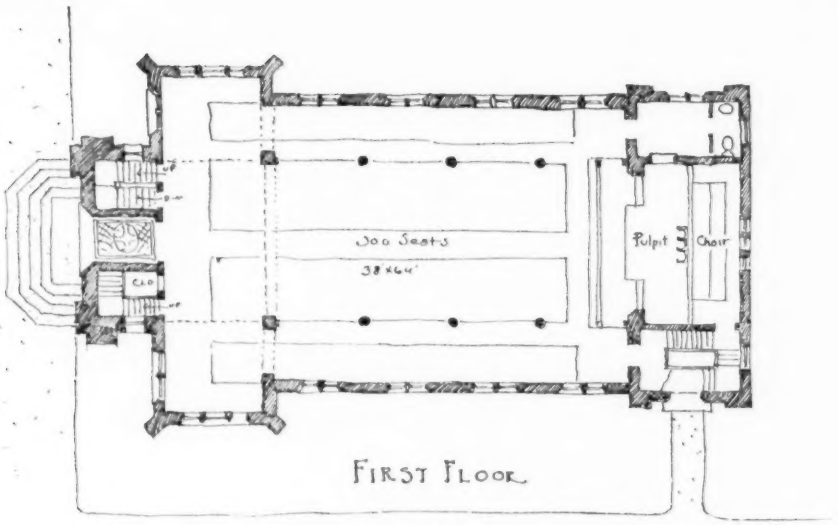


FIG. 4. CHURCH AT KATONAH AVENUE, NEW YORK CITY—MAIN FLOOR PLAN.
Milton See & Son, Architects.

SUNDAY SCHOOL AND AUDIENCE HALLS IN ADJACENT STRUCTURES.

We have, then, only two possible and convenient plan dispositions to accommodate both audience hall and Sunday School room in the same building: that of placing them in juxtaposition, with or without the possibility of combining them into a single hall at will, as was outlined in the September issue of the Architectural Record, and that of placing one above the other, as has been indicated in

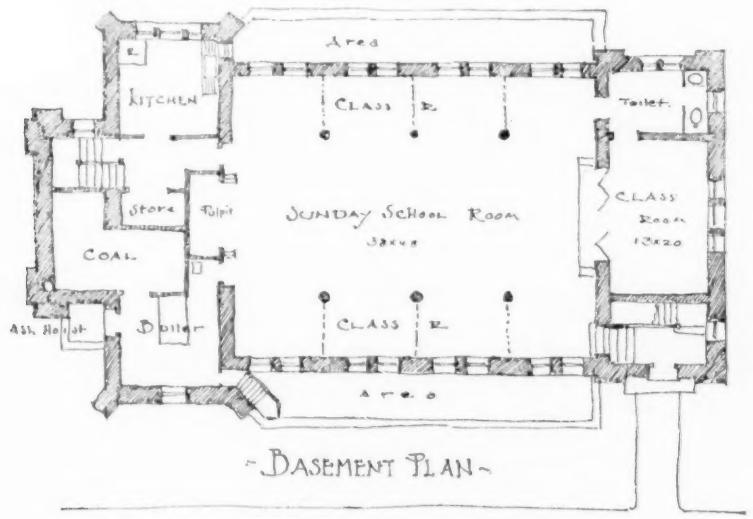


FIG. 4a. CHURCH AT KATONAH AVENUE, NEW YORK CITY—BASEMENT PLAN.
Milton See & Son, Architects.

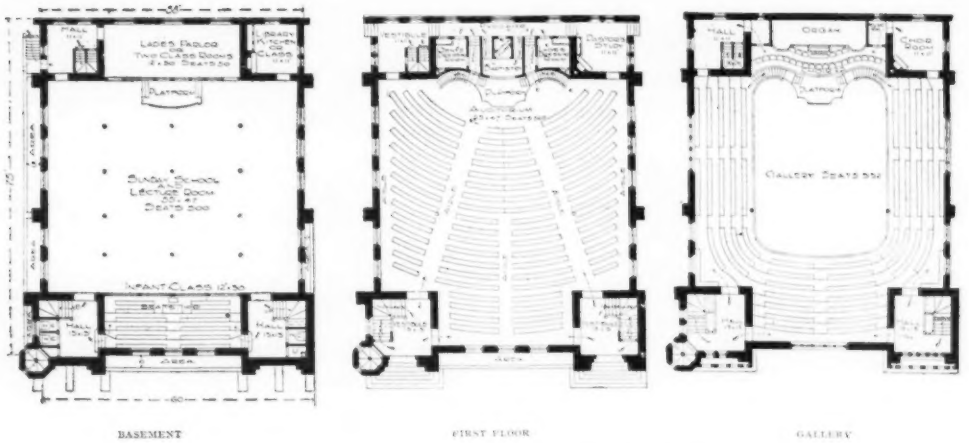


FIG. 5. NINTH STREET CHRISTIAN CHURCH, WASHINGTON, D. C.
L. B. Valk & Son, Architects.

the preceding paragraphs. The ultimate and ideal solution, offering all possible advantages for the full and adequate service to be rendered by the Sunday School, must be a separate building devoted solely to its own needs or possibly combining these with other less churchly requirements, a building with separate exterior mass treatment of its own, connected, if necessary, by means of passages, cloisters or other less definite motives with the main edifice. (Figs. 8, 9, 10.) This makes additional demands upon available land and involves a decided increase in the amount of necessary funds, not to mention certain inconveniences, such as those of heating, ready access from one building to the other, and the like. It

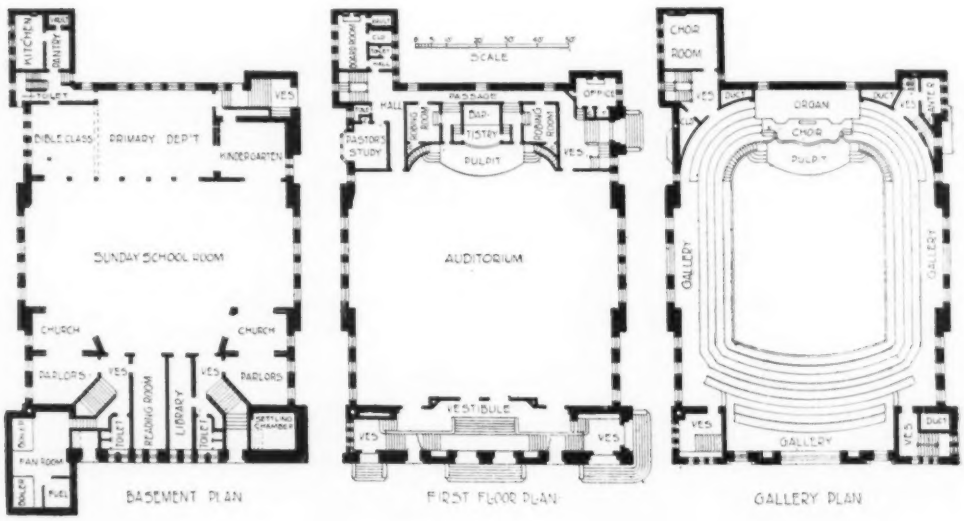


FIG. 6. FIRST BAPTIST CHAPEL, BROOKLYN, N. Y.
G. W. Kramer, Architect.

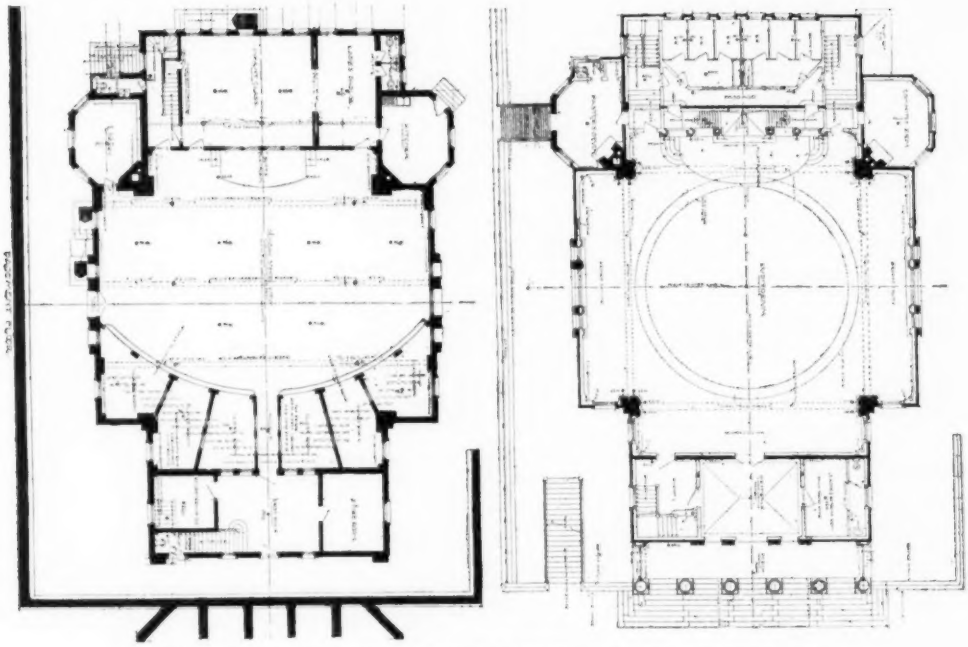


FIG. 7. PONCE DE LEON AVENUE BAPTIST CHURCH, ATLANTA, GA.
Haralson Bleckley, Architect.

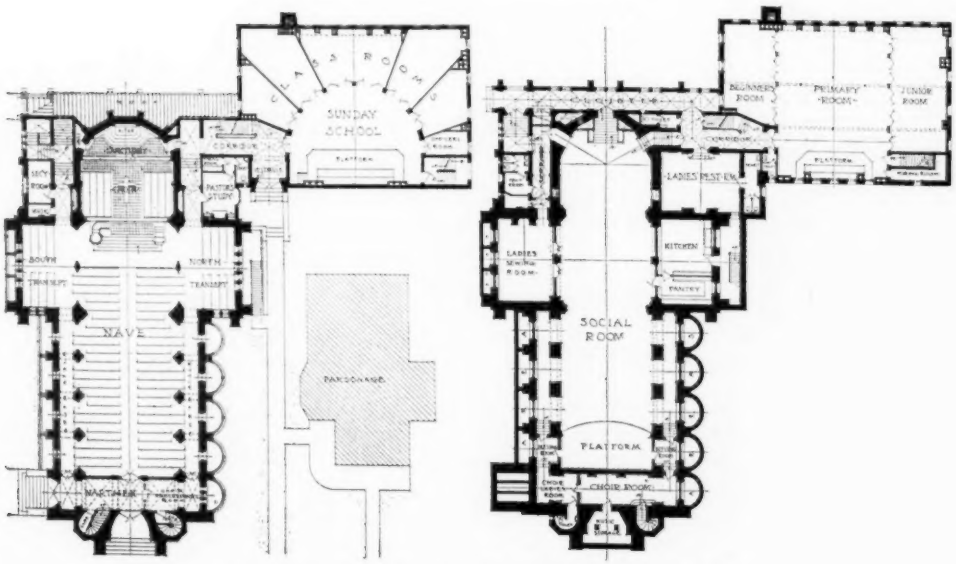


FIG. 8. TRINITY LUTHERAN CHURCH, AKRON, OHIO.
J. W. C. Corbusier, Architect.

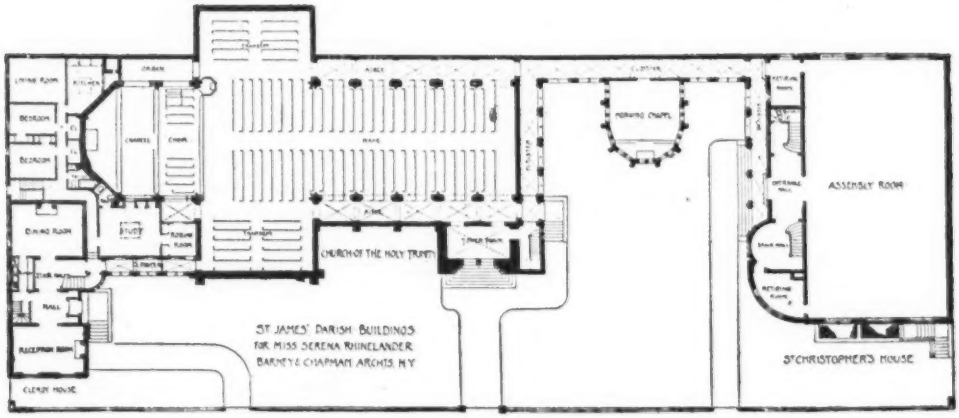


FIG. 9. ST. JAMES PARISH BUILDINGS.
Barney & Chapman, Architects.

also places a severe limit upon the capacity of both buildings, as indicated by the maximum dimensions of a single floor with galleries, for the large area made possible by the combination plan has in this arrangement been recast into more than the equivalent space, but disposed in a number of floors. The reasonable

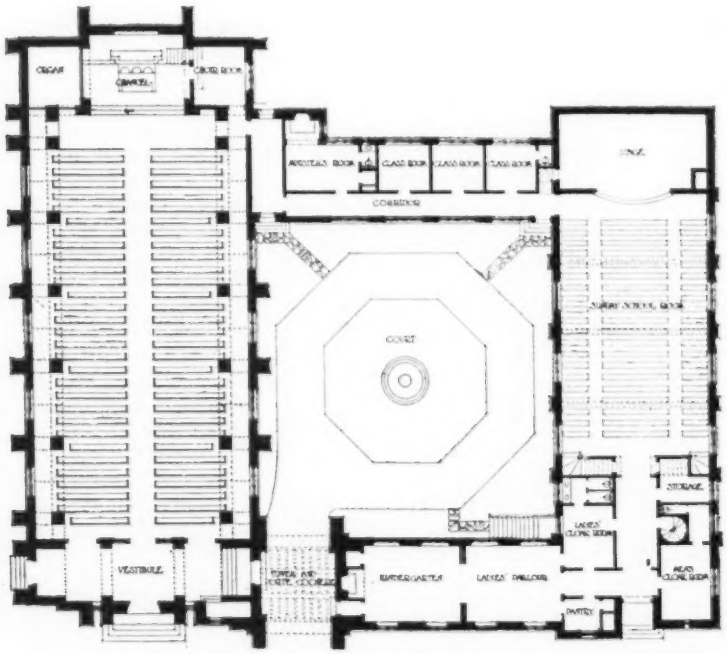


FIG. 10. UNITARIAN CHURCH, WEST NEWTON, MASS.
Cram, Goodhue & Ferguson, Architects.

maximum of attendance which may be expected upon festival and other occasions bringing together large numbers of people, could therefore never be taken care of in either structure within the compass of a single room, unless the unreasonable course be followed of making the floor area of either building of sufficient size to provide for such infrequent gatherings.

The plan disposition in two buildings, if at all feasible, commends itself especially because it makes available for other purposes the added space beneath both structures. (Fig. 8.) There is also the fertile advantage of building to any neces-

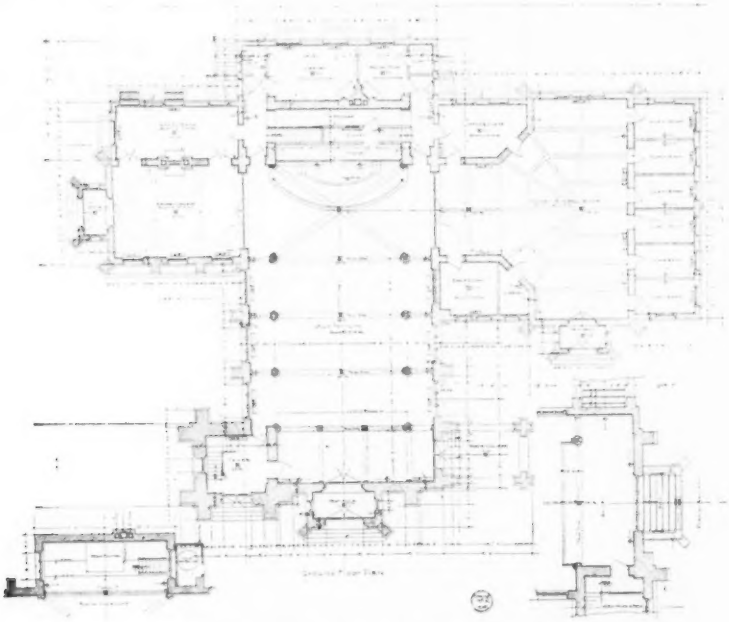


FIG. 11. METHODIST EPISCOPAL CHURCH, SOUTH MILLEN, GA.
Wallin & Young, Architects.

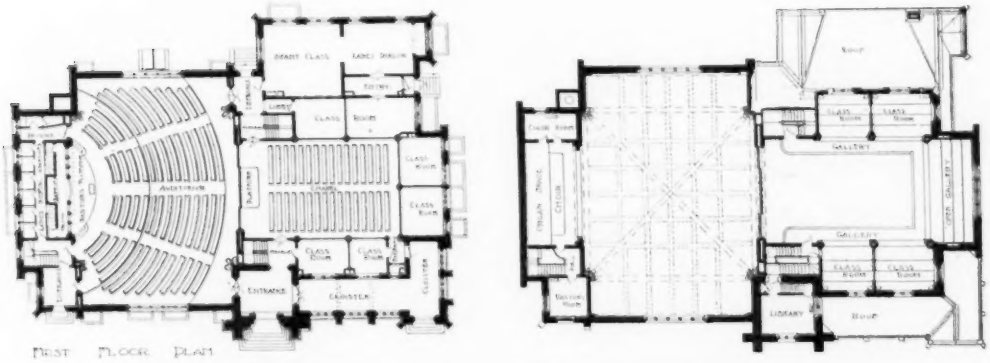


FIG. 12. FIRST BAPTIST CHURCH, WATERTOWN, MASS.
Charles B. Dunham, Architect.

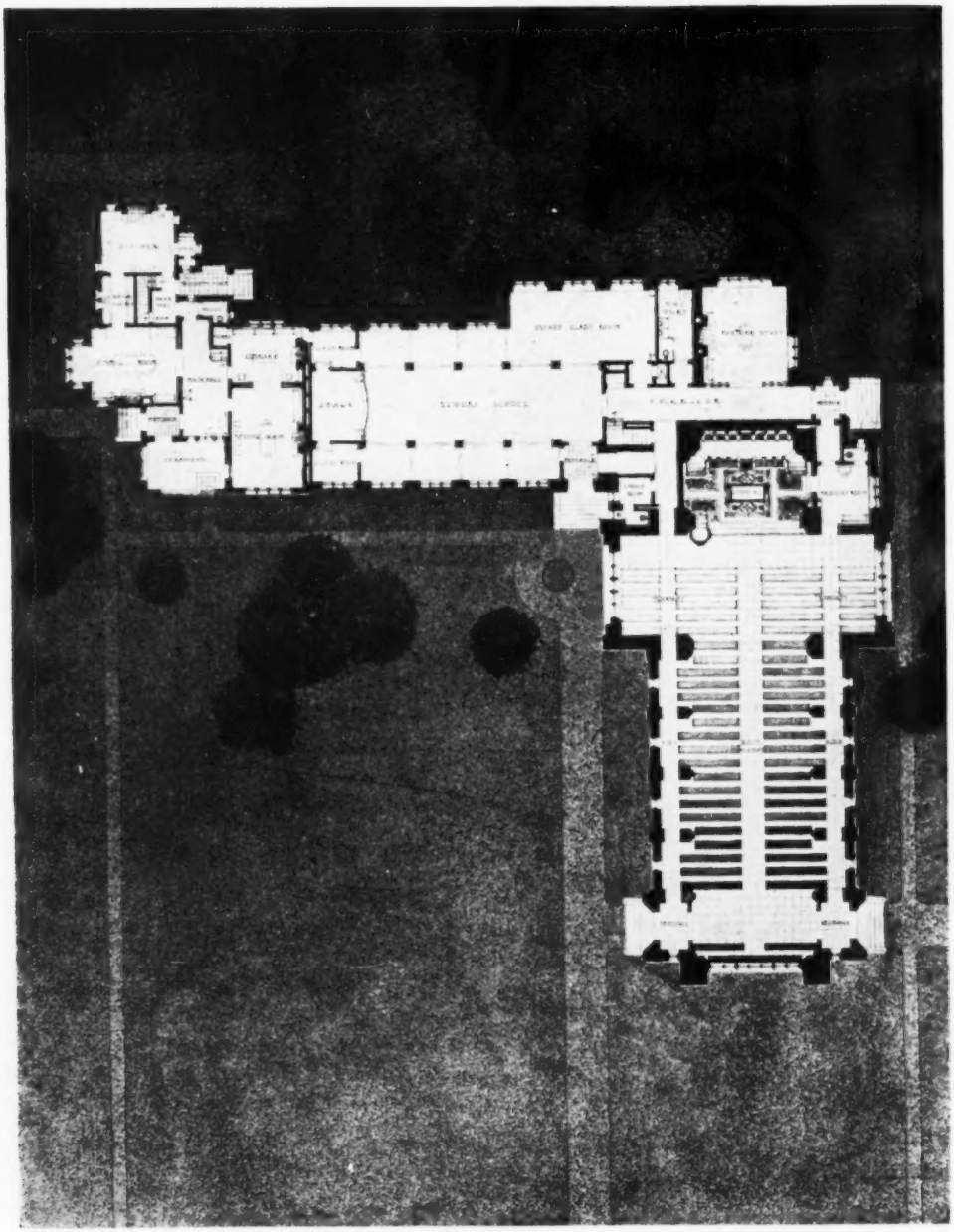


FIG. 13. RUSSELL SAGE MEMORIAL, FAR ROCKAWAY, N. Y. CRAM, GOODHUE & FERGUSON, ARCHITECTS.

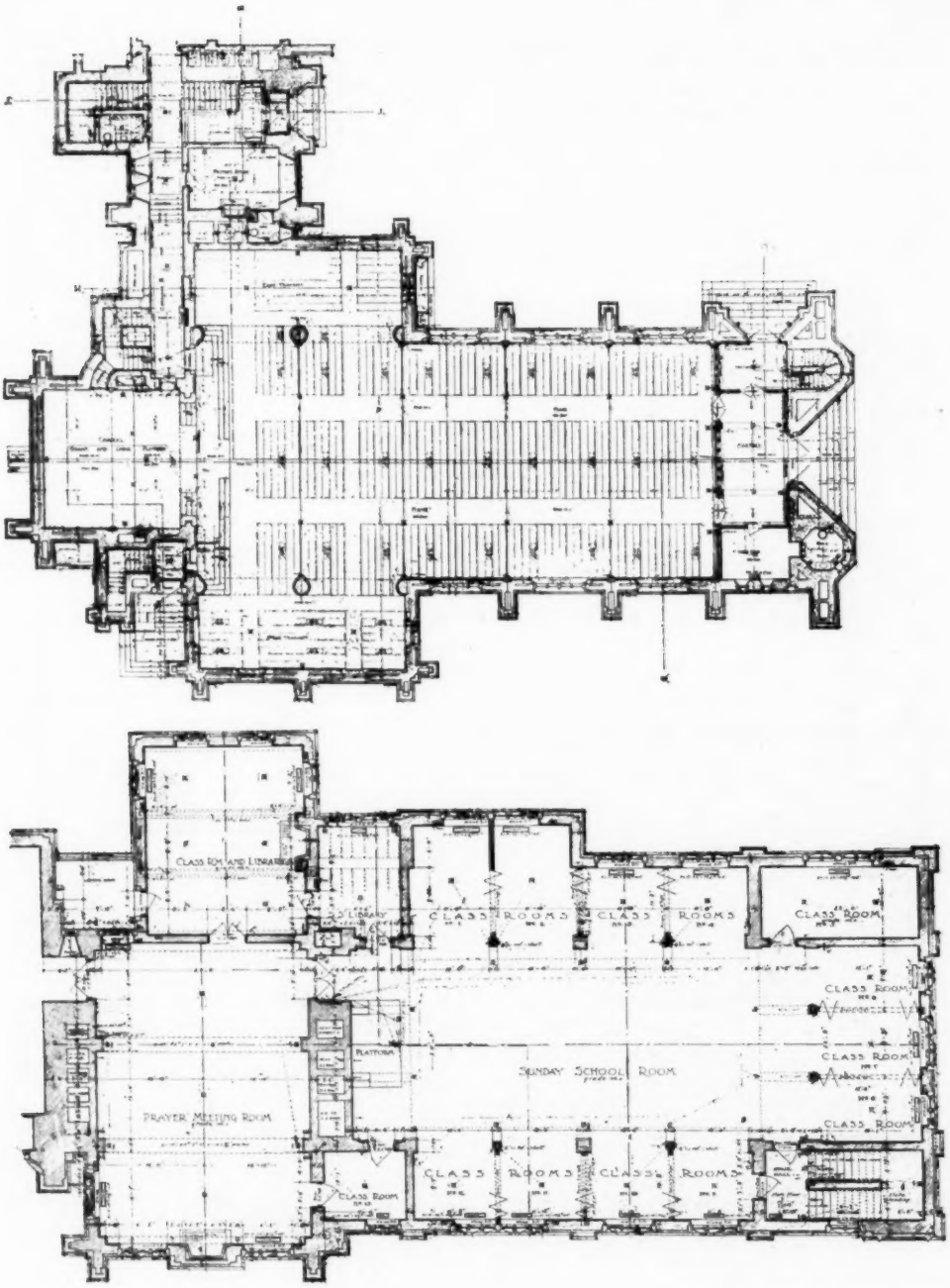


FIG. 14. EUCLID AVENUE PRESBYTERIAN CHURCH, CLEVELAND, OHIO. CRAM, GOODHUE & FERGUSON, ARCHITECTS.

sary height in the Sunday School, for the whole matter of the provision for this requirement in a separate building is still in a state of flux and there has yet been established no precedent to limit its height or area, beyond the actual demands of any individual plan or design with regard to the conditions it is calculated to meet. It becomes a problem similar to that of any school, involving to-day. This problem of the congregation of complex activity will be separately considered in a later article.

THE SUNDAY SCHOOL ROOM.

It would seem feasible to consider at this point, before continuing to the discussion of the church building and accessories which constitute what may be called the complex plan, the question of the interior disposition of the Sunday

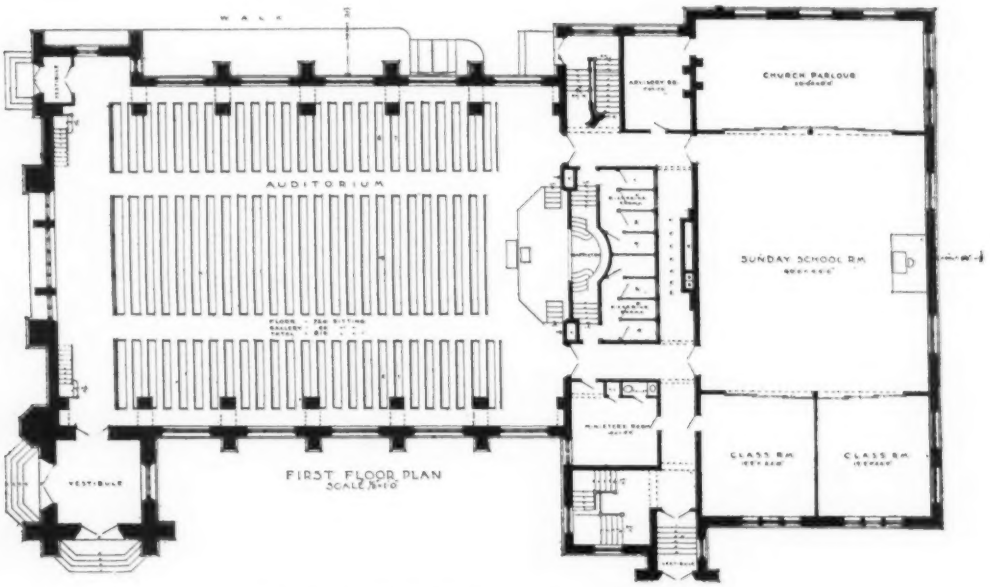


FIG. 15. BAPTIST CHURCH IN BROOKLINE, MASS.
J. A. Schweinfurth, Architect.

more and more the same facilities and safeguards and conveniences which may be expected in a building devoted to regular scholastic purposes. Since the structure may, therefore, be in several stories, the complex activities of the busy modern church may be housed therein and ample provision is thus made for the rapidly increasing field of community service. In this manner we approximate the parish house problem, with which that of the Sunday School is inextricably bound up, and this carries us quite away from the actual church plan itself and involves ultimately a variant of the club house plan, combined with the Sunday School plan, in accord with the broadening civic scope of the church of School room. In this we are at once confronted with the alternative of disposing its parts so that they may or may not be thrown into a general open space as the exigencies of the service may demand. An old method of arrangement, which has been relegated entirely with the newer and better appreciation of the needs of the Sunday School, is that which brings the pupils together for the opening and concluding parts of the service, or for other purposes as occasions might arise, and then sends each class to a separate classroom, such rooms being separated by permanent walls, for the study of its lesson. (Fig. 11.) This plan is still used upon rare occasions, when particular conditions of a given building or site so

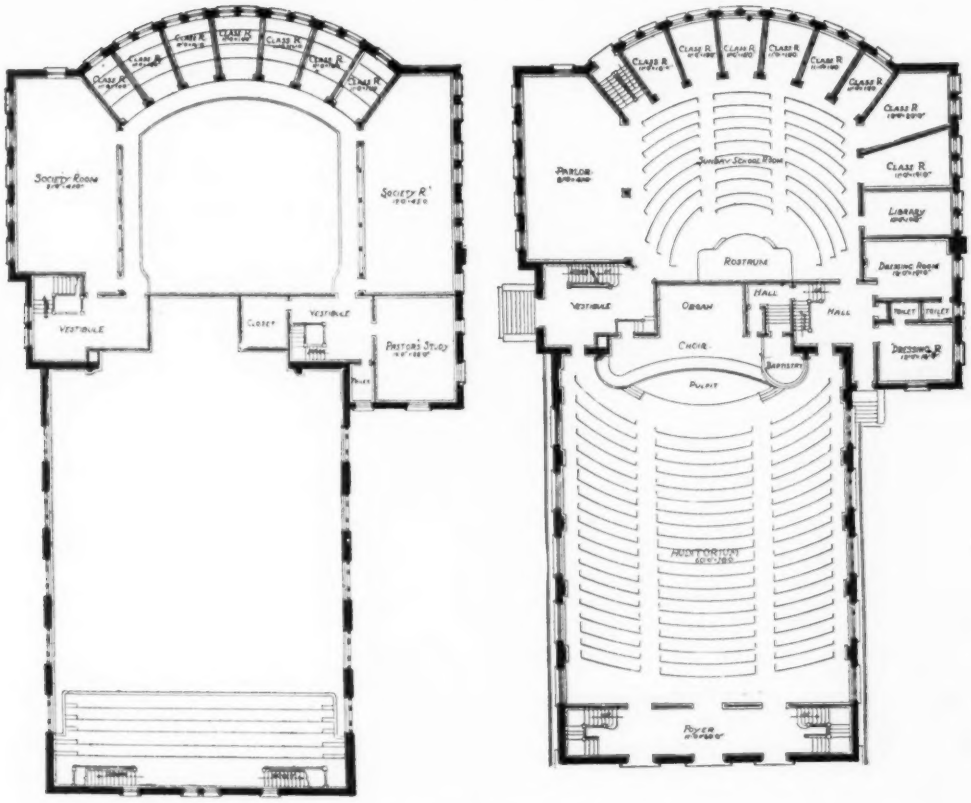


FIG. 16. FIRST BAPTIST CHURCH, MOBILE, ALA.
R. H. Hunt, Architect.

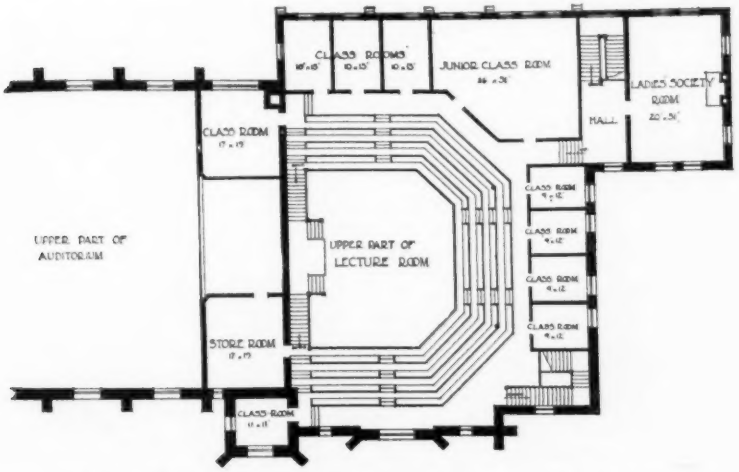
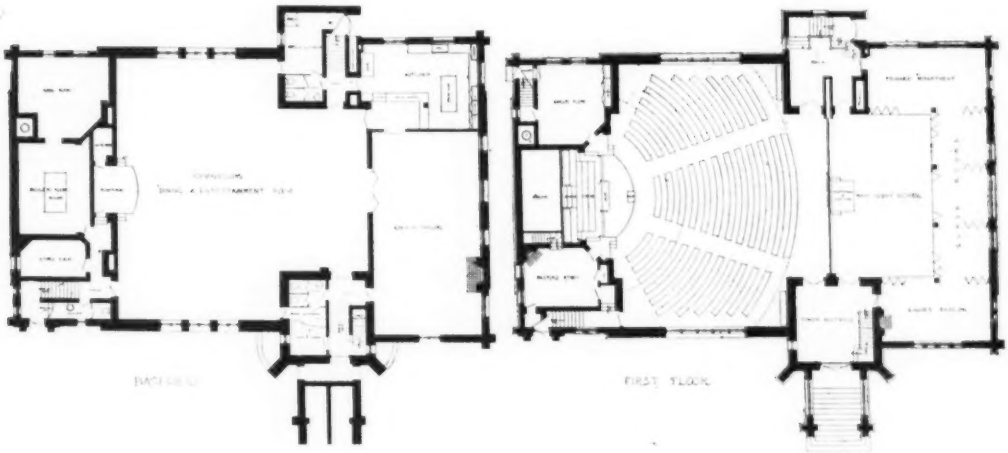


FIG. 17. SECOND PRESBYTERIAN CHURCH, LOUISVILLE, KY.
MacDonald & Dodd, Architects.

require, or when the rooms thus gained may be of particular use for other purposes. But it is obvious that the best purposes of the Sunday School are not thus met.



Again, if the Sunday School room is to serve for the many meetings, fairs and other entertainments usually thrust upon it, and if it be regarded primarily from that angle, instead of from that of actual school requirements, it must be built with the minimum number of supports and the seats may not be fixed. To be sure, these conditions are not necessarily incompatible with Sunday School needs, for while the whole school participates during a portion of the service, the teaching is done in classes, and if no other provision is made for the class work, it will be necessary to eliminate all fixed seatings so that a seat grouping system may be used therefor. In such an arrangement, however, where not even a temporary subdivision of the main room is possible, the all too frequent lack of discipline is apt to nullify the whole value of the teaching.

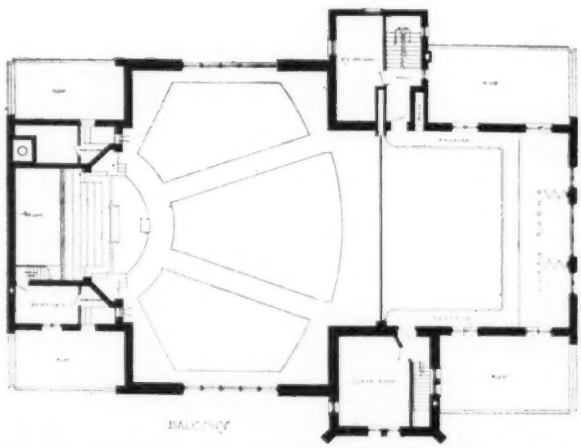


FIG. 18. FIRST PRESBYTERIAN CHURCH, HOWELL, MICH.
Sidney R. Badgley, Architect.

It had gradually come to be recognized, therefore, that a scheme which would prove expedient for both joint and individual meetings of classes and involving a minimum of movement and circulation would be necessary. The solution was found in what has been termed the Akron plan (Figs. 20, 21, 26, 27), developed largely through the efforts of the architects, Walter Blythe, Jacob Snyder, George W. Kramer, and a number of others more recently identified with the problem. This type of plan involves an arrangement of subdivisions, on one floor level or also in a gallery, all arranged radially with reference to the position of the superintendent's platform, and all

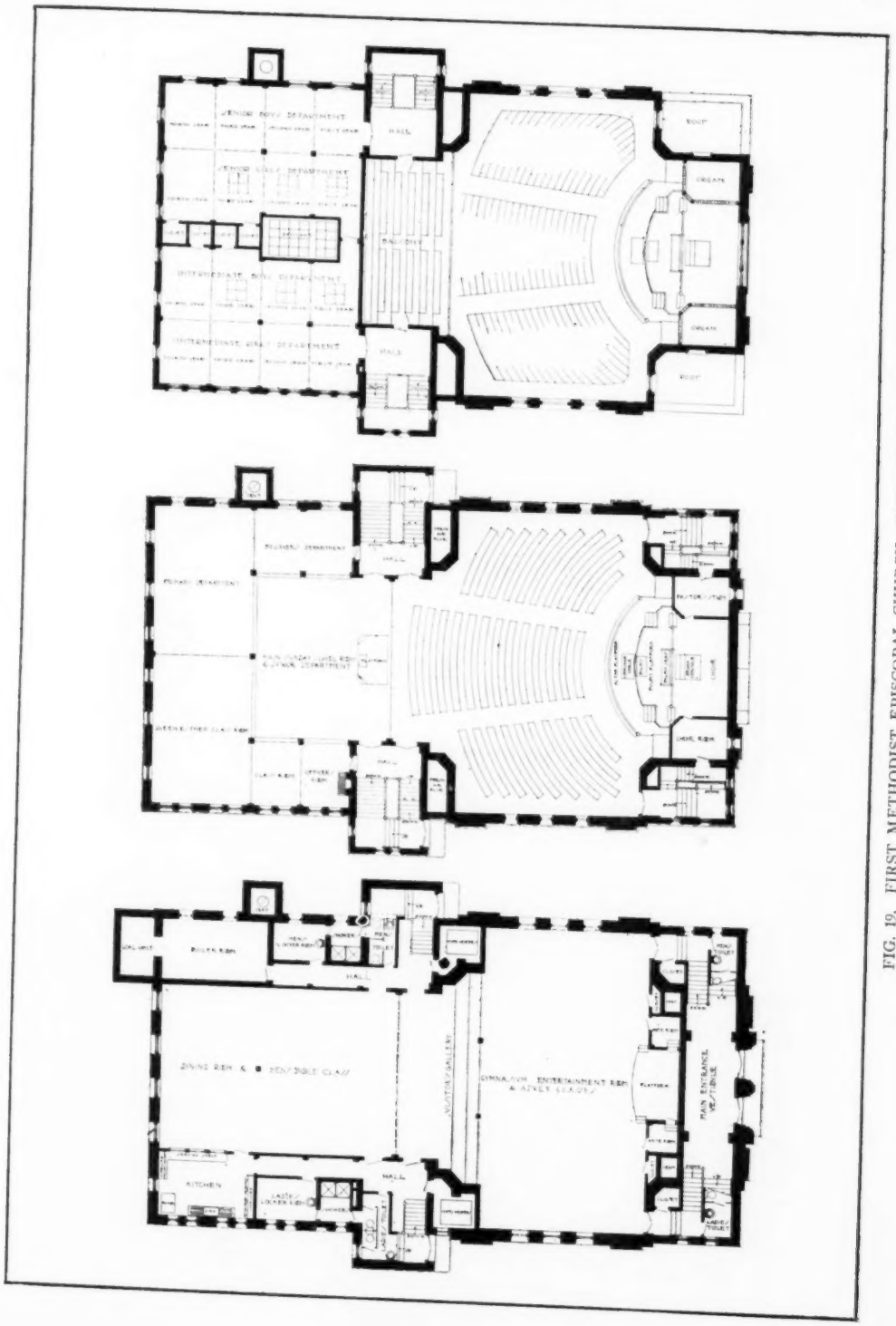


FIG. 19. FIRST METHODIST EPISCOPAL CHURCH, CLINTON, IND.
Sidney R. Badgley, Architect.

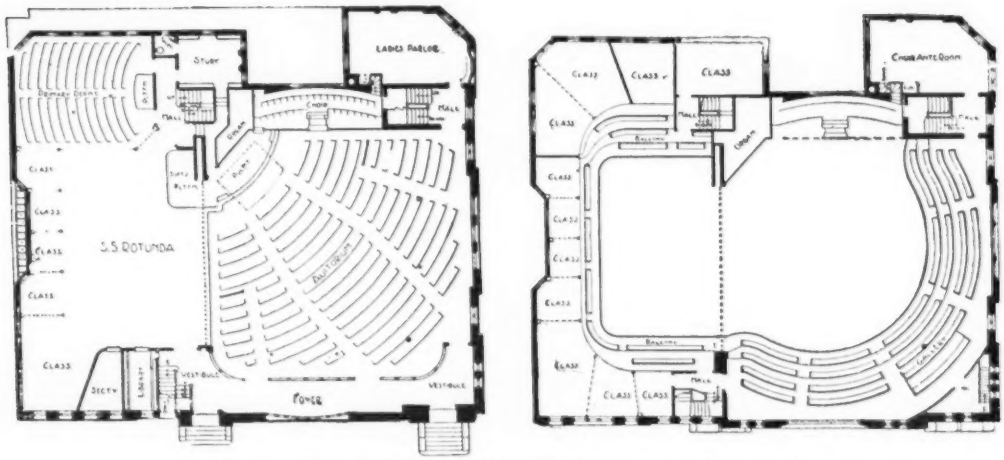
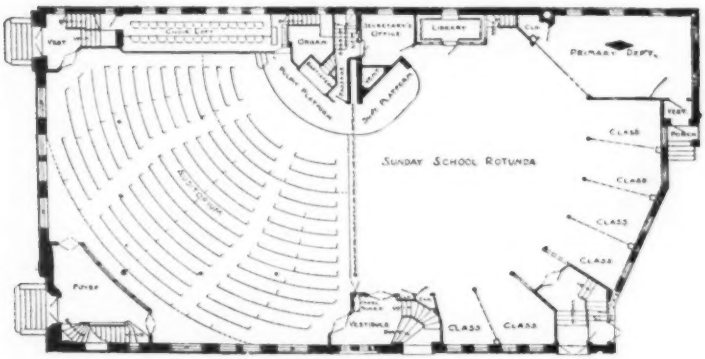
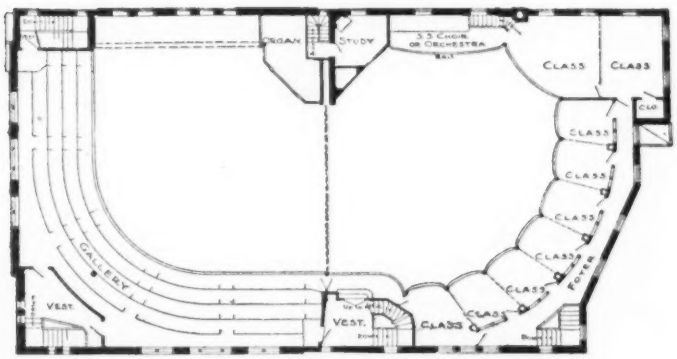


FIG. 20. ARK CONGREGATIONAL CHURCH, NEW YORK CITY.
Kramer & Hamilton, Architects.



Main Floor Plan.



Gallery Level Plan.

FIG. 21. CENTRAL CHRISTIAN CHURCH, HUNTINGTON, IND.
George W. Kramer, Architect.

opening upon a main central space, usually denominated the rotunda. All subdivisions are provided with means of shutting them off from one another and from the rotunda with but the slightest loss of time, and all when opened into the rotunda are within speaking and visual range of the speaker on the platform. In this manner both types of service, collective and individual, are provided for without actual movement of the classes, except on the main floor of the rotunda, if this also is to be used for class work. This expedient was obviously a decided advance over the method of walled classrooms, to which classes were to retire, chiefly because of the practical elimination of moving about of classes. All commotion in the handling of groups of persons, even of adults, is the equivalent of lost time, which in a service occurring once weekly implies a serious detriment. To be sure, there remains the Utopian ideal of a change of rooms as methodical and closely managed as that of the departmental system in the public schools, with the utmost regularity and precision, but this has not yet been realized in any other type of school, and the young mind promptly sees the difference in the possibilities for disorder in schools, which happen to convene upon Sunday instead of upon weekdays. Ultimately, of course, the new graded system in Sunday Schools will bring a more thorough management throughout into being and this difficulty could be obviated, but in the meantime the solution has followed, however, the channel of the other solution indicated above, namely, that of the Akron plan, which was much in favor and is still in vogue in all buildings of the combination plan types discussed in an earlier paper. This plan really dates from about 1866 or 1867, and was the original inspiration of a layman, Lewis Miller, who worked it out in the First Methodist Episcopal Church of Akron, Ohio, whence its name was derived. The Akron plan, together with its variations (Figs. 16, 20, 21, 25), has been the foundation of practically all Sunday School planning, both under good and under unfavorable conditions, for many years, and has had to cede the field only in most recent years to the advance of the graded lesson plan, to be indicated below.

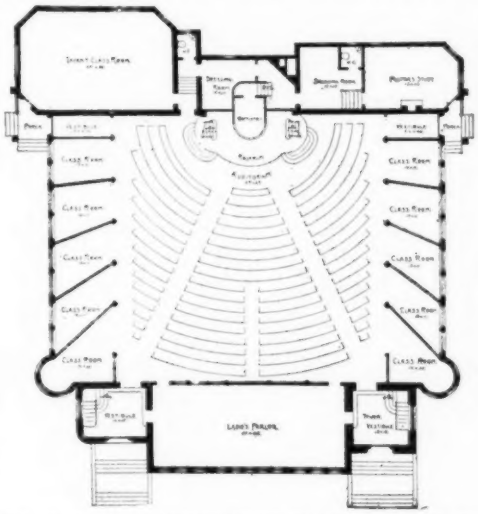


FIG. 22. THIRD BAPTIST CHURCH, OWENSBORO, KY.
R. H. Hunt, Architect.

However, the Akron plan has not held undisputed sway, despite its obvious utility. Instead of its semi-circular or semi-elliptical plan, some have favored a rectangular scheme of classrooms. (Figs. 12, 13, 14, 15, 18, 19, 23.) In almost all examples of this type the need for all available floor space seems not to have been so urgent, and classes were required to move from rotunda to class room and back again respectively at the beginning and ending of the lessons. In such arrangements, on the other hand, the same types of collapsible partitions are favored, because of the opportunity of throwing all parts of a single floor level into one large room for general purposes.

In order to facilitate the subdivision of available space into class rooms, a number of varieties of collapsible partitions have been devised, which may fold or roll or coil or slide into sockets built for them. Their movement may be vertical or horizontal, and they may be built to collapse or telescope or roll together in sections or to rise or slide as units. The mechanical operation of these par-

titions has been made entirely "fool proof," and latterly a system of control levers or buttons has been devised by means of which all class room subdivisions, and, if required, also the partition between church and Sunday School room in the combination plan type, may be opened or closed from the central platform in a few seconds without movement on the part of members of the school or congregation.

In similar manner it has been found feasible and useful to have the Sunday School room provided—where the general plan permits—with a separate keyboard connecting with the organ of the church auditorium, so that when both rooms are not simultaneously in use the organ may be operated from either side at will.

The platform itself in the case of the combination plan type may be of movable or collapsible construction, but if permanent or if situated in a building in which auditorium and Sunday School room are separated by a permanent wall, the platform may be amplified in proportions so as to respond more readily to the various requirements which the Sunday School space must meet under average conditions. If the denomination places no restrictions upon theatrical performances, provision for these can easily be made and dressing rooms provided at the sides of the platform, which may then be called the stage. The latter would probably also be large enough, or could readily be made of sufficient size, to accommodate a chorus or orchestra for choral concerts. Sufficient toilet space in accordance with these additional provisions, coat rooms, property storage space, archives for music and instruments and school text books, possibly also retiring rooms for superintendents and teachers would then complete the equipment of the Sunday School room, most of these considerations being dependent upon the size and activity of the school body and other societies within the congregation.

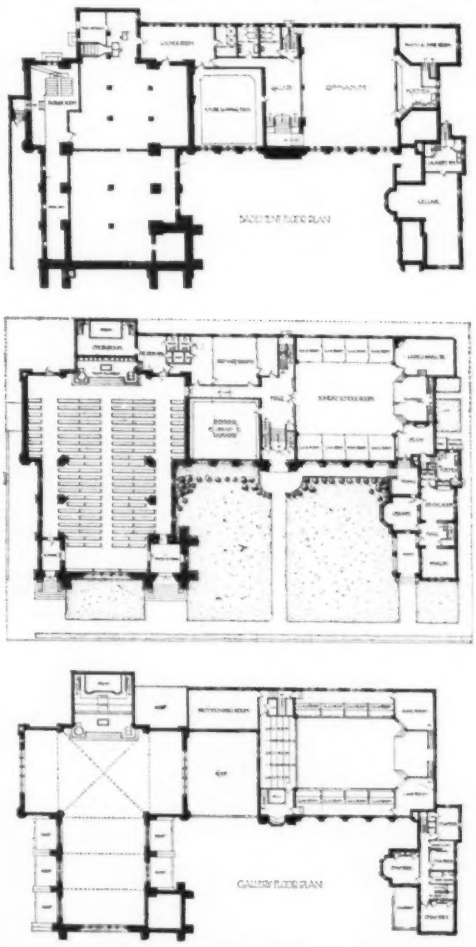


FIG. 23. RICHARDSON MEMORIAL PRESBYTERIAN CHURCH, PHILADELPHIA, PA.
Chas. W. Bolton & Son, Architects.

The question of the subdivision of the main floor space or rotunda during the lesson period cannot, however, even in the Akron plan, be adequately met. At best the subdivisions, if this floor space is to be used for lesson purposes, must be of a portable and therefore very slight type. Usually an arrangement of poles and curtains is resorted to, but this is highly unsatisfactory, because it is not sound proof. In fact, the solution usually results in placing the oldest children or even adults in this space to reduce the amount of unconscious movement.

The question of lighting deserves special notice likewise. In the Akron plan the issue is directly met and exterior light

is provided for all of the alcove subdivisions, although always with the restriction that all but the corner alcoves must be content with light from only one side, while the central floor space or rotunda receives diminished light from the same source and additional direct light from skylights.

In this plan type, also, there is the advantage of the duplicate semicircle of class rooms for which space is available in the gallery (Figs. 16, 20, 21, 23, 25, 26, 27). In the usual Akron plan there are class rooms in the gallery itself, and, when the partitions are in place each room becomes a small stepped theatre in arrangement. When the partitions are raised or otherwise withdrawn, the whole is thrown into a single gallery with continuous seating levels. For circulation convenience two or three steps of this gallery are often left unencumbered in front of the alcoves (Fig. 25). A variation of this gallery plan provides for class rooms behind the gallery, to which classes withdraw for lessons. In this scheme the gallery is not used for lesson purposes (Fig. 17).

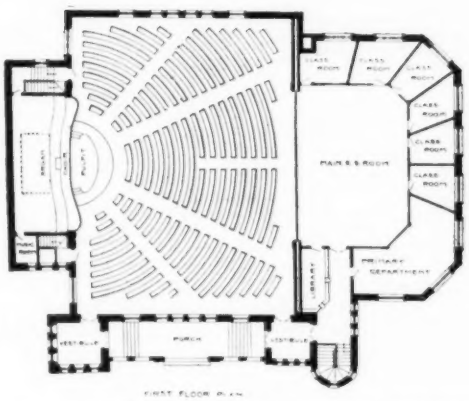
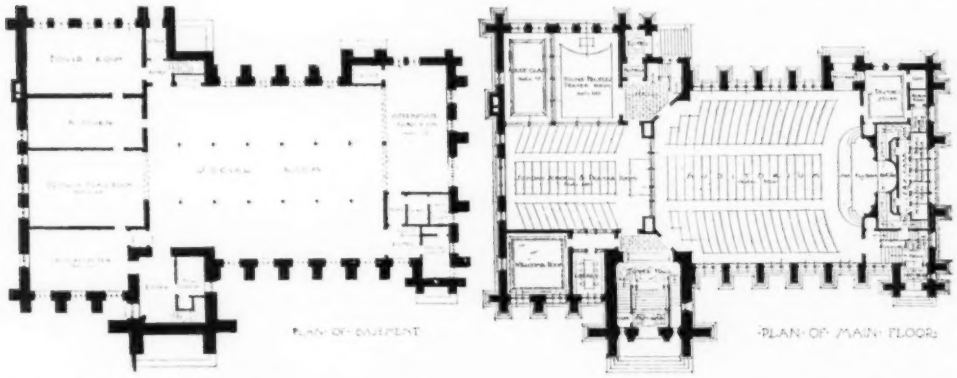


FIG. 24. FIRST PRESBYTERIAN CHURCH, GOUVERNEUR, N. Y.
S. R. Badgley, Architect.

It should be understood, of course, that in all plans considered to be of the Akron type, no single system of arrangement, beyond that of the fundamental idea of radiating class rooms has been followed. There are numerous examples showing derivative dispositions, in which, for instance, the subdividing walls of the class rooms are in form of fixed glazed partitions, others again in which only the corner rooms are thus permanently set apart and the others may be thrown together as indicated above. In the same manner



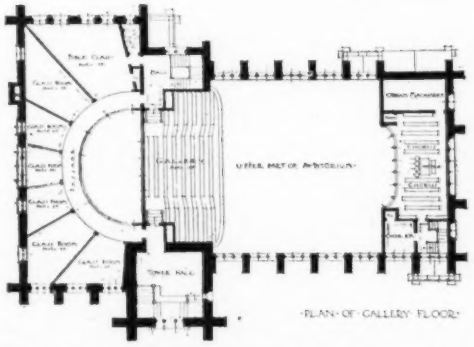


FIG. 25. FIRST BAPTIST CHURCH, MELROSE, MASS. COMPETITIVE DESIGN.
C. H. Blackall, Architect.

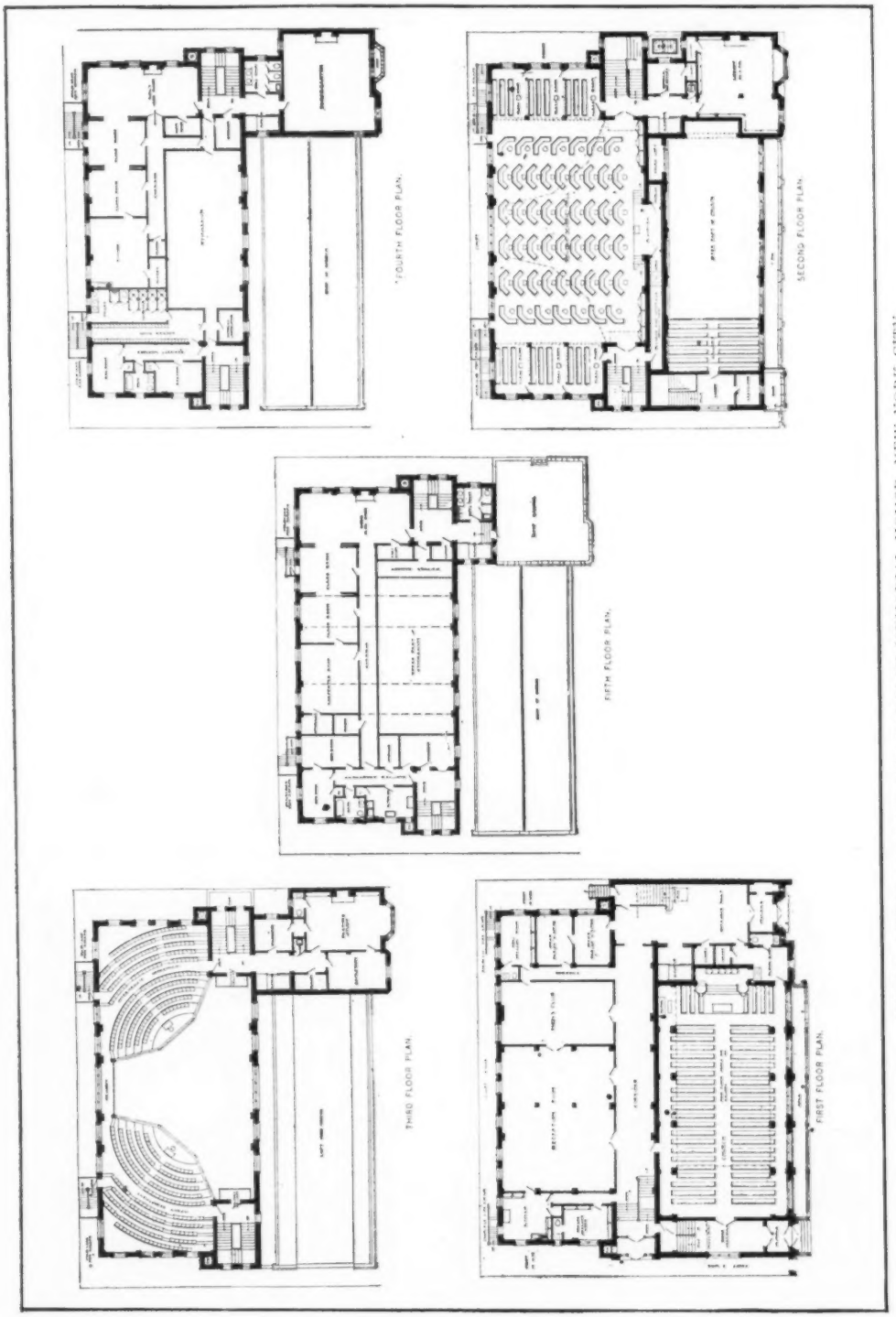


FIG. 26. CHRIST CHURCH AND BABCOCK MEMORIAL HOUSE, NEW YORK CITY.
Parish & Schroeder, Architects.

this or that department or subordinate part of the general school may be placed separately in a particular part of the edifice and cut off from the services at large.

And finally there is the combination of the auditorium with the Akron plan type of Sunday School, so that the audience hall galleries may be subdivided for school purposes, the space beneath the galleries, likewise, while the main seating space of the congregation may or may not be used as the size of the school may demand. (Fig. 22.)

These various expedients, however, all point toward the single solution which must be considered final if the best service of the Sunday School is regarded as the first requirement of the Sunday School building. (Figs. 23, 28, 29.) This solution implies the separate building for the Sunday School, planned in accordance with its own needs, and combined or not as may seem expedient or necessary in individual cases with other secular activities of the church. The separate building is made necessary, furthermore, by the rapid growth of the grade system of Sunday School teaching. Thus we find that the greater detailed character of the lessons has necessitated bet-

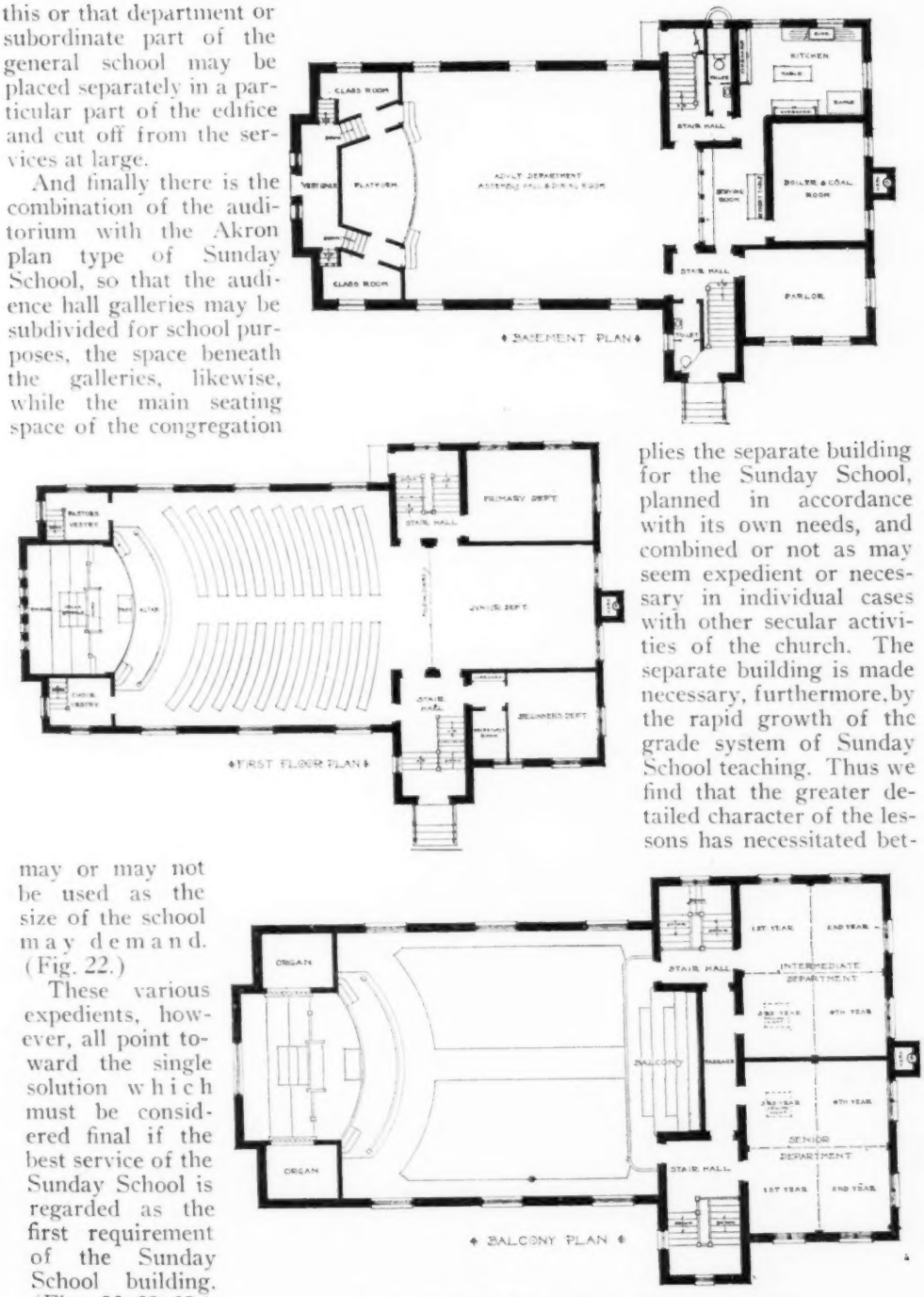


FIG. 27. SUGGESTED SUNDAY SCHOOL BUILDING.
S. R. Badgley, Architect.

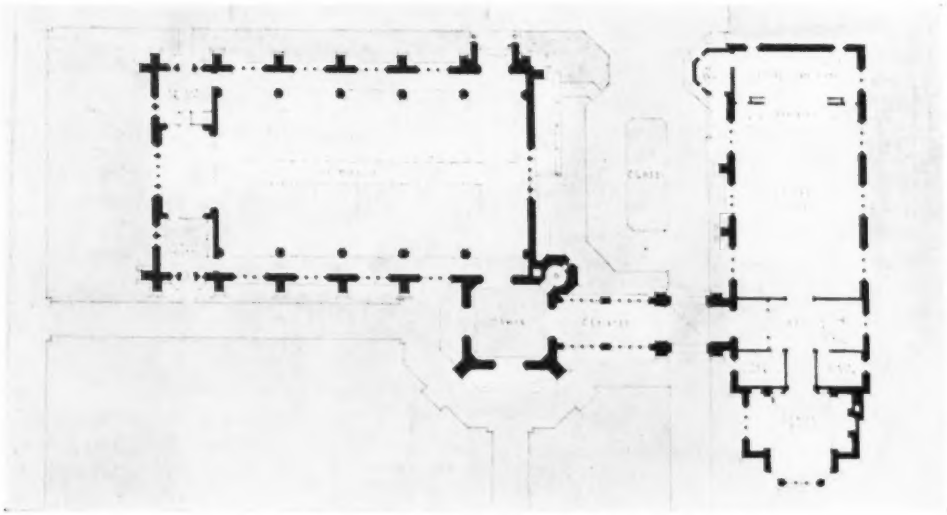


FIG. 28. SECOND CONGREGATIONAL CHURCH, LYNN, MASS.
Nelson & Van Wagenen and George H. Breed, Associate Architects.

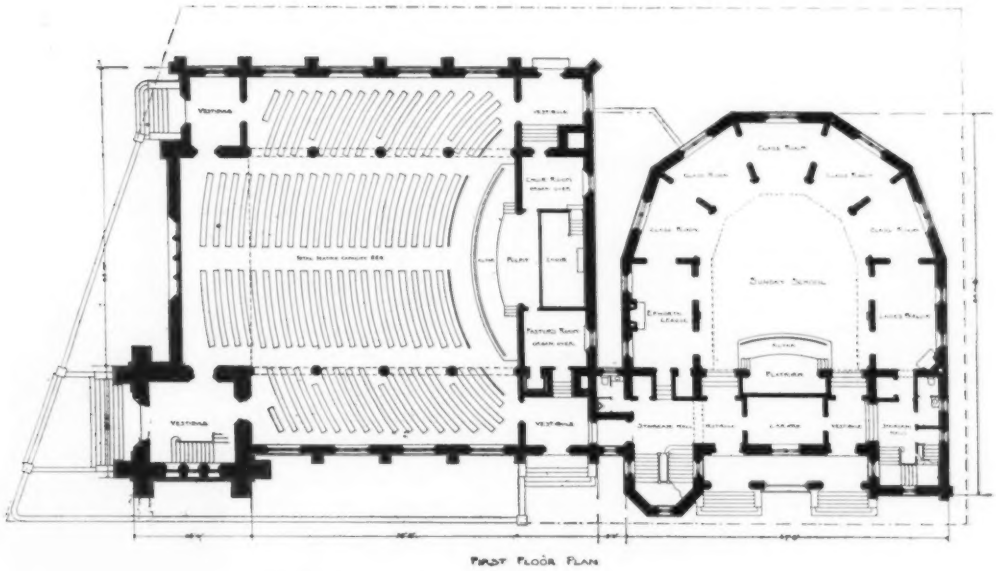


FIG. 29. FIRST M. E. CHURCH, GERMANTOWN, PA.
Rankin & Kellogg, Architects.

ter facilities for isolating classes, and this is further abetted by the number of grades in which the material brought to the knowledge of pupils is arranged according to difficulty, character and meaning, in other words pedagogically,—as the word school would connote. The conception of doling out to children the truths which adults themselves in many cases must have explained to them, the idea of simply a younger congregation, has lost favor entirely and the proper management of the Sunday School primarily as a school has led to a number of interior plan changes which more adequately respond to scholastic requirements.

As a school building, the Sunday School then becomes subject to certain further requirements in regard to safety, sanitation, lighting, construction, and other considerations distinctly characteristic of a teaching institution. (Figs. 26, 27.) The class rooms are no longer subdivisions of a larger room, but sound proof compartments. The teachers are themselves taught to teach and the pedagogics or methods of teaching have been found indispensable. It is notable that this development is not of long standing and that only in fairly recent years has the teaching basis or school basis been considered at all necessary in the Sunday School. If it is borne in mind that the Sunday School in its graded system must provide for fourteen or even more grades of instruction gauged and grouped in a series of departments according to age for children, adolescents and adults, it will be seen that the whole question has come to be regarded as a serious business and that its problems seem in a fair way to be given the necessary attention, and various schemes of planning have been devised in which the classes are grouped in departments in the plan, but without loss of the opportunity of throwing all departments together. Nor does the problem end there, for parallel with the growth of the graded system is also to be witnessed the growing complexity of the civic or community activity of the church, so that it has begun to minister to human needs in a multitude of directions, all to be accommodated within its own or accessory buildings. This brings us to the complex plan type, which deserves separate study in a subsequent paper.

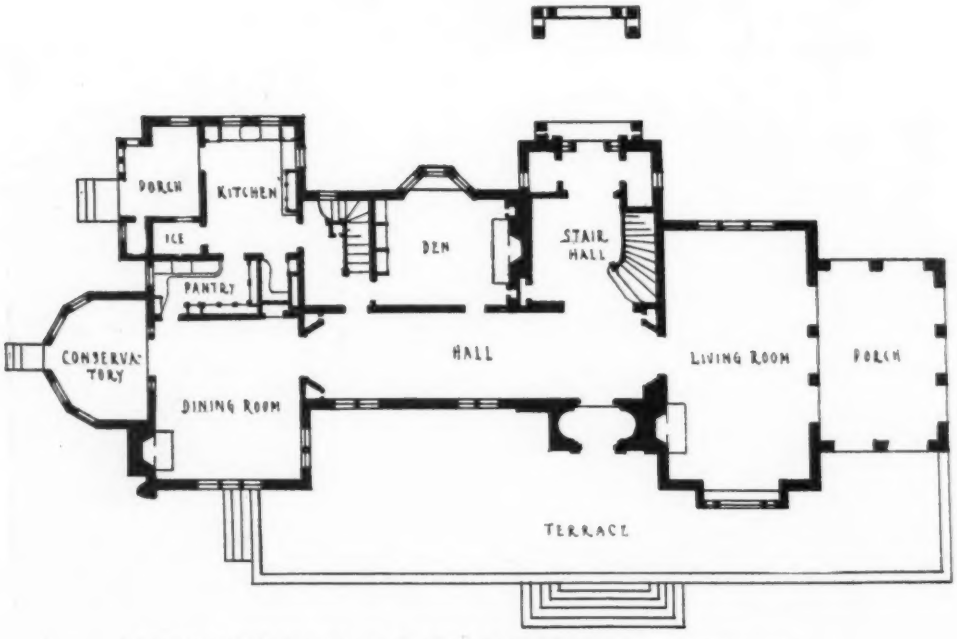
Note:—Due to typographical errors caused by alterations in sizes of illustrations just before going to press, certain plans in the August issue were incorrectly attributed. Readers are requested to note the following errata: The captions of figures 10 and 11, and of figures 14 and 15 should be interchanged.

(To be continued.)

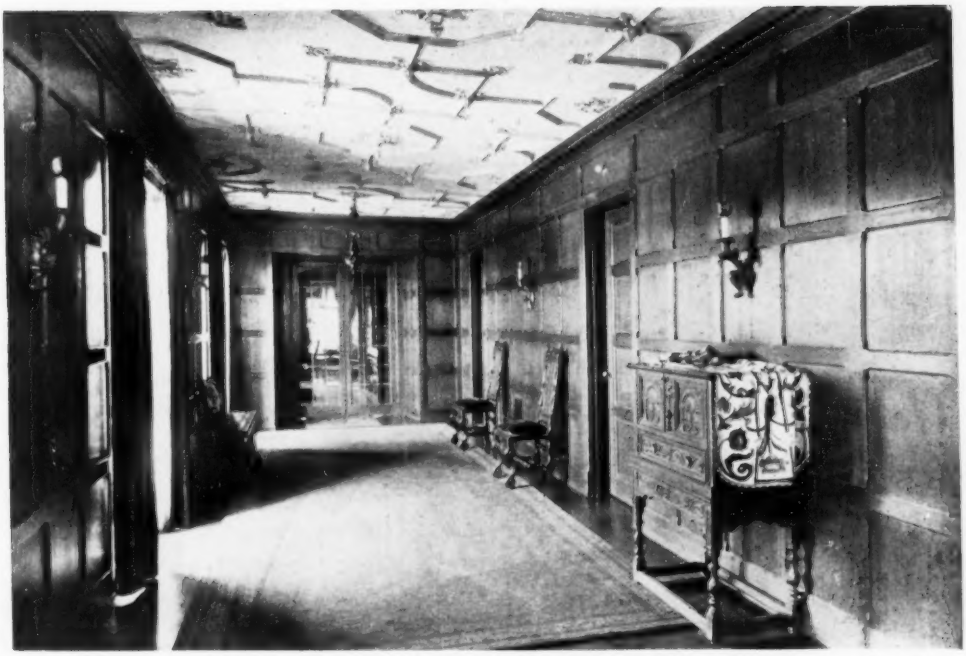
HOUSE OF S. S. HINDS, ESQ., PASADENA, CAL. MARSTON & VAN PELT, ARCHITECTS.

ENTRANCE DETAIL—HOUSE OF S. S. HINDS, ESQ., PASADENA, CAL. MARSTON & VAN PELT, ARCHITECTS.

LIVING ROOM—HOUSE OF S. S. HINDS, ESQ., PASADENA, CAL.
Marston & Van Pelt, Architects.

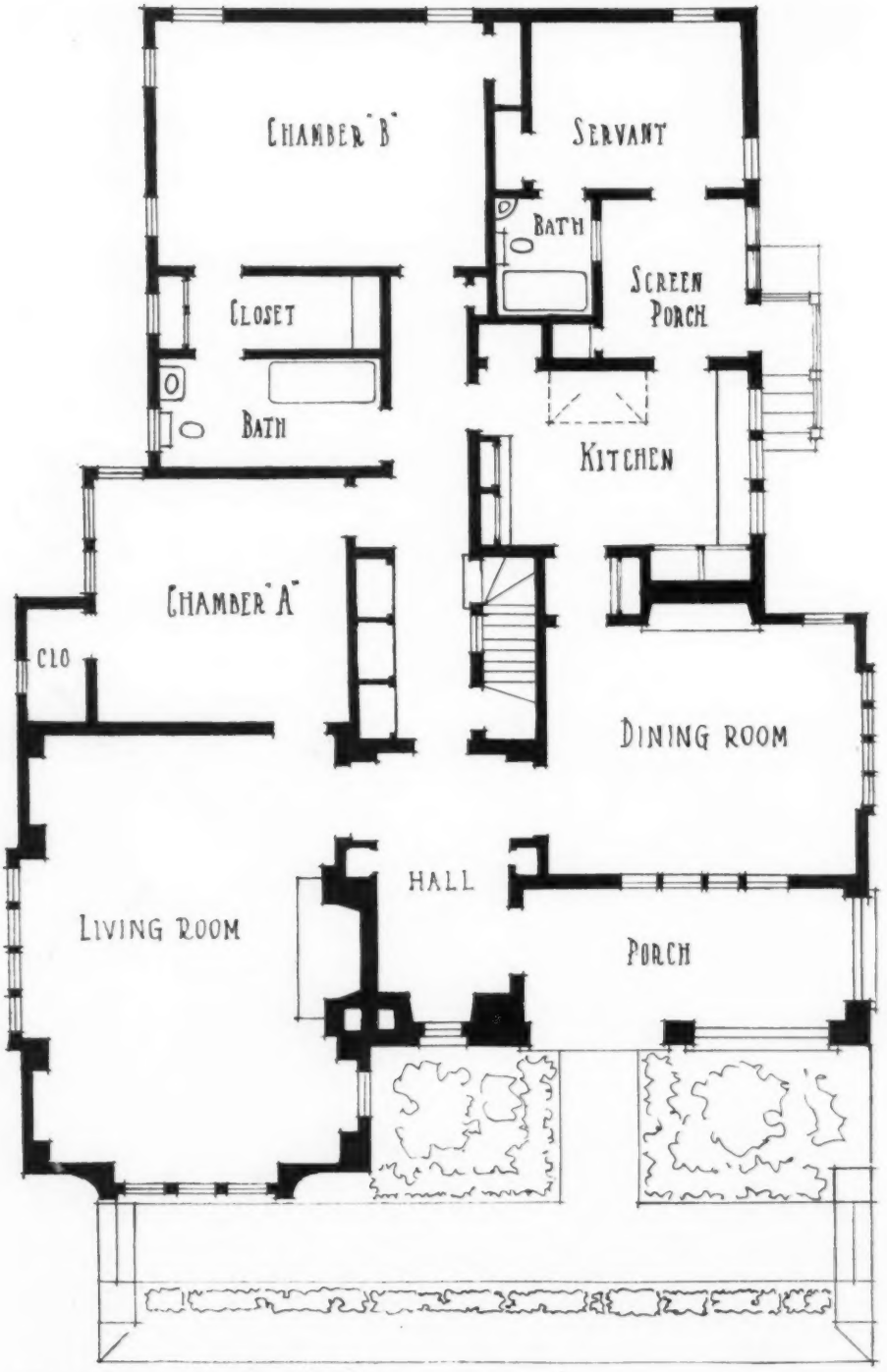


FIRST FLOOR PLAN—HOUSE OF S. S. HINDS, ESQ., PASADENA, CAL.
Marston & Van Pelt, Architects.

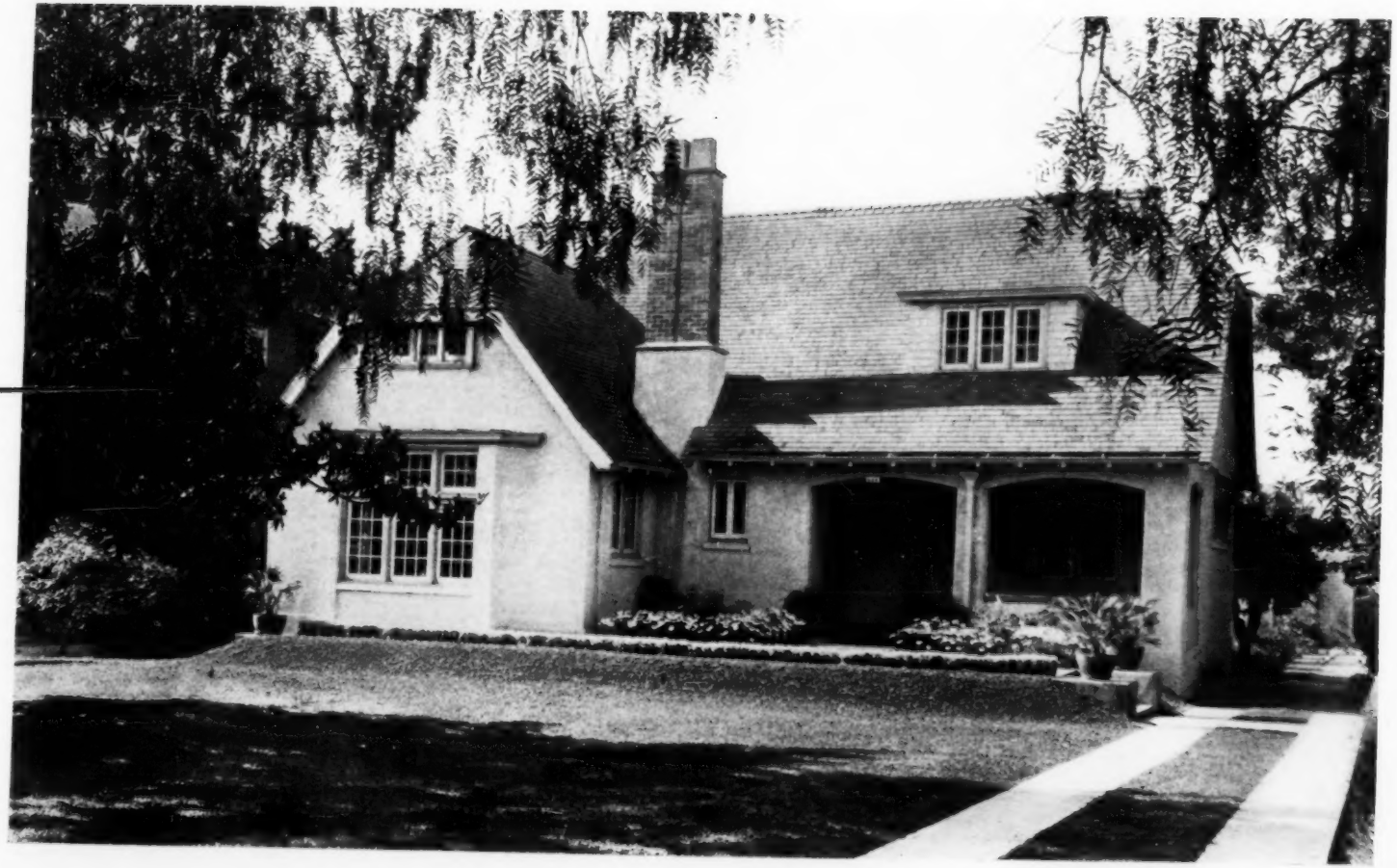


HALL—HOUSE OF S. S. HINDS, ESQ., PASADENA, CAL.
Marston & Van Pelt, Architects.

STAIR HALL—HOUSE OF S. S. HINDS, ESQ., PASADENA, CAL.
Marston & Van Pelt, Architects.



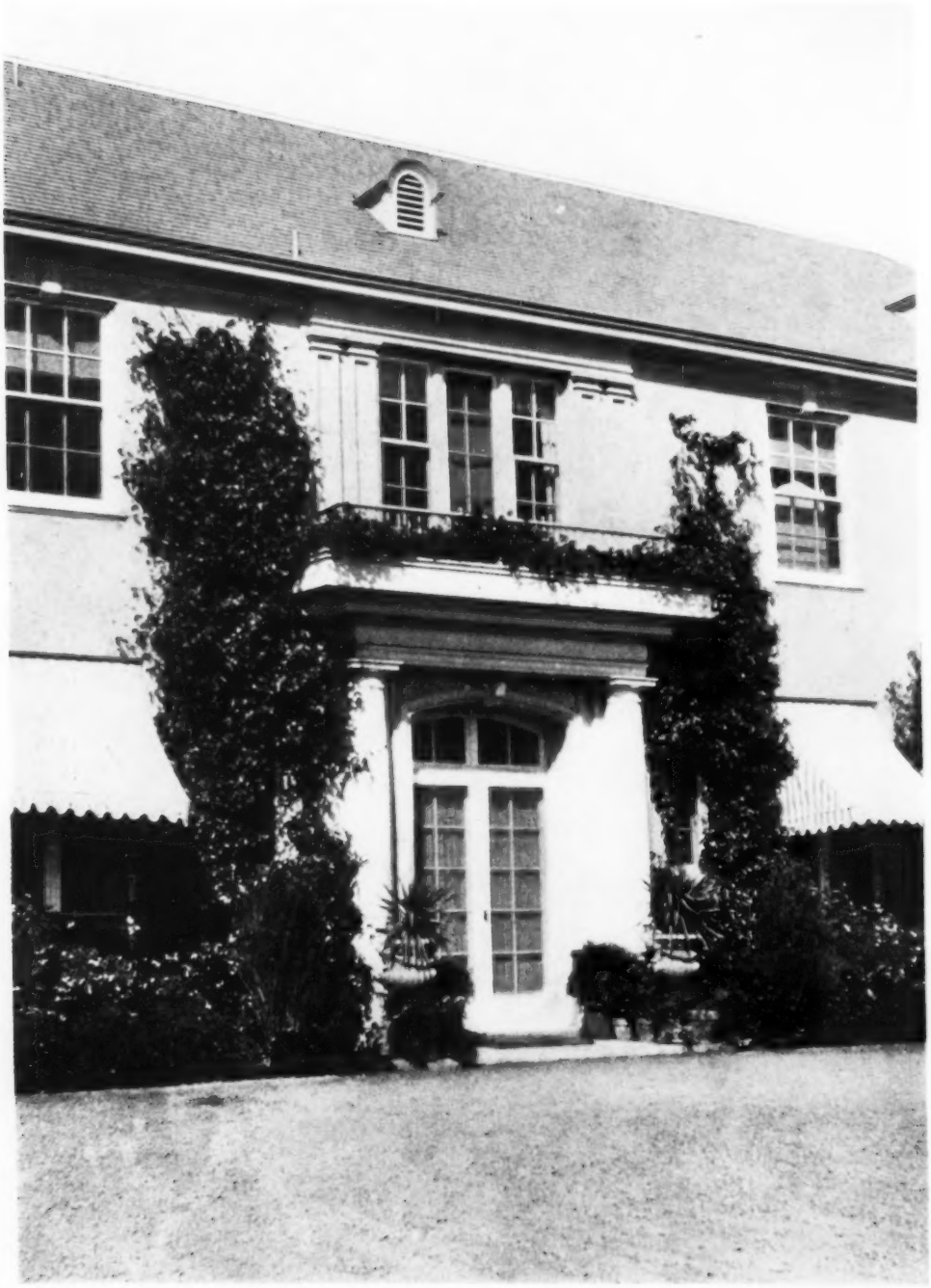
FIRST FLOOR PLAN—HOUSE OF PROF. H. F. WHITE, JR., PASADENA, CAL. MARSTON & VAN PELT, ARCHITECTS.



HOUSE OF PROF. H. F. WHITE, JR., PASADENA, CAL. MARSTON & VAN PELT, ARCHITECTS.

LIVING ROOM—HOUSE OF PROF. H. F. WHITE, JR., PASADENA, CAL. MARSTON & VAN PELT, ARCHITECTS.

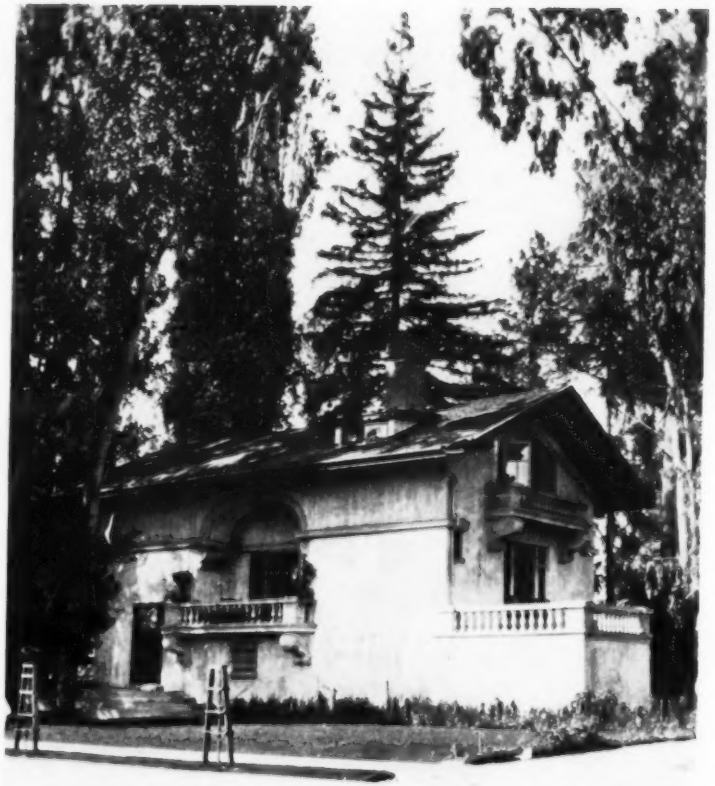
HOUSE AT SAN DIEGO, CAL. WILLIAM TEMPLETON JOHNSON, ARCHITECT.



ENTRANCE DETAIL—HOUSE OF THOMAS DRISCOLL, ESQ. LEWIS P. HOBART, ARCHITECT.

HOUSE OF THOMAS DRISCOLL, ESQ.
LEWIS P. HOBART, ARCHITECT.

HOUSE OF DR. TUFTS.
Maybeck & White, Architects.

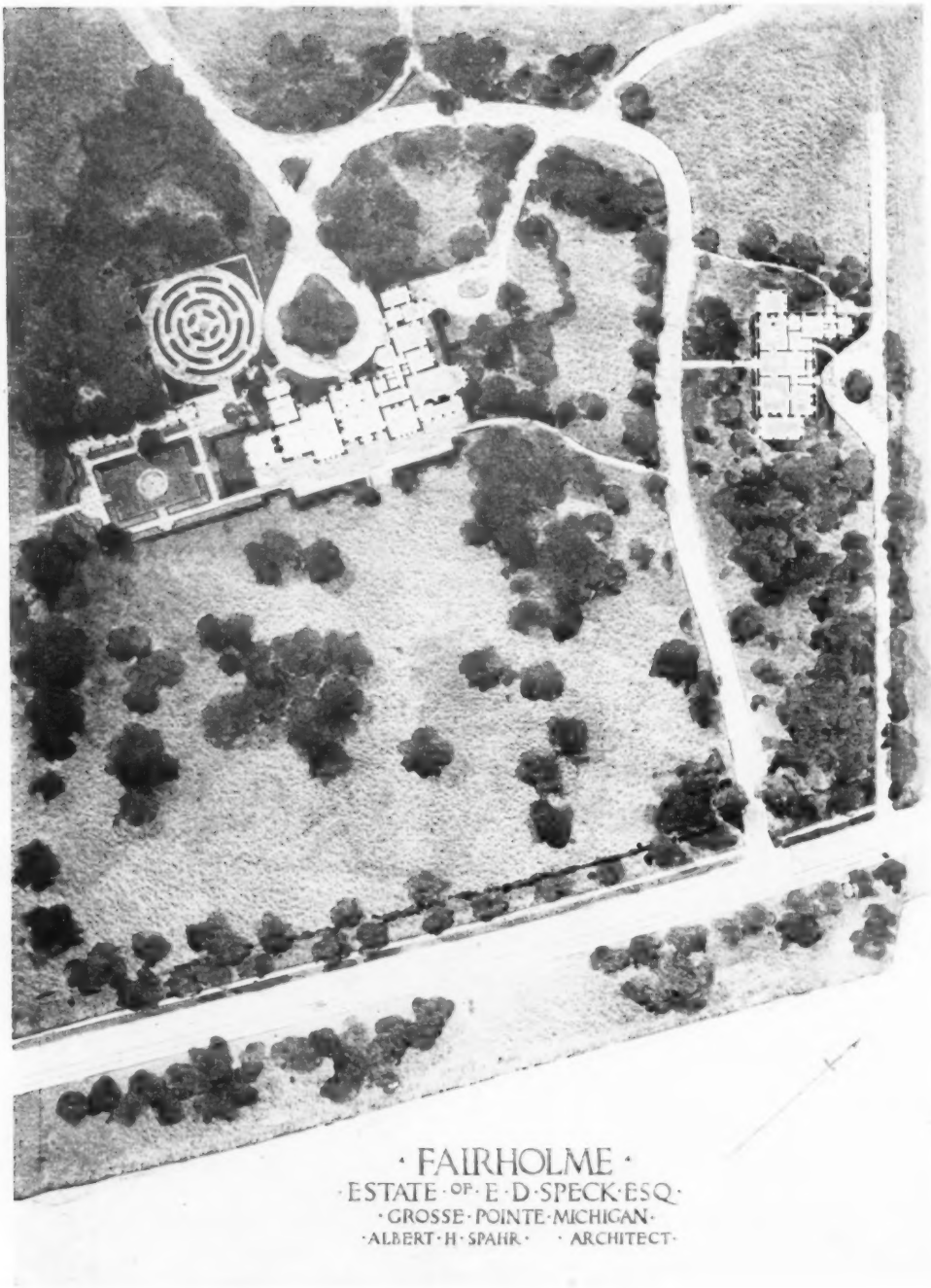


HOUSE OF DR. GATES.
Maybeck & White, Architects.

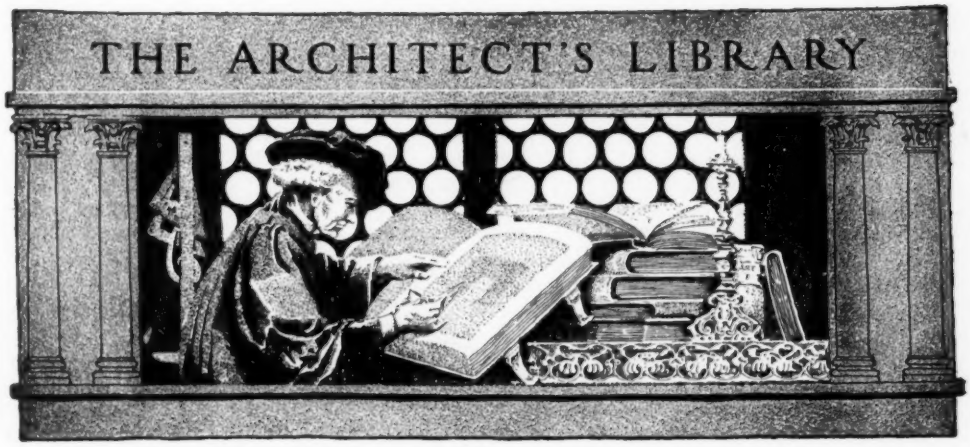
A CORNER OF THE GROUNDS AT THE HOME OF PROF. SENGER, SHOWING TREATMENT FOR SCREENING THE BARN. MAYBECK & WHITE, ARCHITECTS.

HOUSE OF E. D. SPECK, ESQ., GROSSE POINTE, MICH. ALBERT H. SPAHR, ARCHITECT.

REAR VIEW—HOUSE OF E. D. SPECK, ESQ., GROSSE POINTE, MICH. ALBERT H. SPAHR, ARCHITECT.



BLOCK PLAN—ESTATE OF E. D. SPECK, ESQ., GROSSE POINTE, MICH. ALBERT H. SPAHR, ARCHITECT.



BOOKS ON COLONIAL ARCHITECTURE

By RICHARD FRANZ BACH

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Part III.—Dwellings (Continued)

IN the Southern colonies we must expect in the formative years of our architectural history an atmosphere distinctly different from that found in either the New England district or the region of the Middle Colonies. We have to consider here a decidedly English stock, with a minimum admixture of other blood, brought about either by reason of a grouping together of different nationalities for economic advantages within defined charter limits of a single colony, or grant, or by reason of historic Continental influences at work on the eastern shore of England long before Puritanism or even Catholicism had become a fact in the British Isles. Unlike New England, these settlements drew their people and support from what might be termed the upper strata of English life, from the class accustomed to the control of landed estates, the country gentlemen. To be sure, the Southern district is not to be regarded as an exclusive settlement by the aristocracy, but it was largely populated by persons of wealth, and developed into a plantation region, each plantation centering about a manor house, frequently under the control of a younger son or other disgruntled member of the nobility from the home country. The Puritan was not by any means so strong here as farther north, and not a few of the Southern colonists were of Catholic persuasion, as a review of early colonial history will promptly indicate. Then there was also the class of servants, notably indentured servants and others, whom fate obliged to purchase or work out their freedom, and who ultimately became in many cases landholders in a small way, building homesteads or small manor houses as characteristic as those whose grandeur has been heralded through a score of decades.

The domestic architecture of these colonists, then, was decidedly that of the gentry to the manor born, as close a reflection of the type of life from which they were descended as alien conditions, difficult materials and constant danger and hardship could be made to concede. The old wooden house, which must have been the first Southern manifestation in the architectural field, has left no representatives of its character—with the reservation, of course, that its character must be assumed from that to be discerned in

later brick and stone buildings. The latter, unfortunately, have also been superseded in numerous cases here as in other districts by the more gorgeous and decidedly less representative Georgian type, but are still readily to be studied from extant examples. It is a matter for congratulation that such a number of the early buildings has actually come down to us. No doubt their original materials, being of more permanent character, are largely responsible for this heritage. The type of these buildings is easily recognizable; its charm is unavoidable. Its history runs a separate course, occasionally to be seen making contact with the forms of the Middle Colonies and in rare instances offering some indication of a migratory influence from farther north.

The quality of the gentry found better scope and representation in the later Georgian phase of our formative architecture, which very obviously bore the earmarks of their station in life and original mode of living before the journey across the Atlantic had been undertaken. We must allow for wealth, partly their own and partly the direct gift of a generous environment, and also for the intelligence which is the concomitant of culture. Their buildings were centers of hospitality and reflected this quality in their spacious interiors and in their greater decorative treatment, not infrequently giving ample indication of an idle class in the population that well knew the comfortable existence that might be drawn from an easy soil carefully managed. The Georgian buildings are usually of considerable size, and convey the peculiar charm of the rambling house, the rambling being, however, a matter of careful disposition.

Southern colonists also betray the interest for architecture and the understanding of its qualities and principles that during a few score years before their time had formed so pleasing a characteristic of the minds of English nobility. One recalls the Society of the Dilettanti and the efforts of no mean calibre ascribed to the hand of Lord Burlington. In this country we note in similar capacities, but in minor degree of polish and finesse of execution, the efforts of Washington and Jefferson in various dwellings and churches, as well as the beginnings in the way of new structures in the embryonic capital city and the comprehensive scheme of the University of Virginia.

For general discussions of this region we must draw attention again at the beginning to the inclusive collections of measured drawings mentioned at various times in these papers, and to the historical material likewise mentioned previously. Nothing has yet appeared covering the whole Southern colonial area with proper subdivision into separate colonies. But this type of project would not, perhaps, be as gratifying an undertaking for the compiler or writer as are the more numerous volumes covering individual colonies. A book treating of the whole Southern district would be of decided interest, however, and we look forward to the vaulting ambition of some of our more recent students in this rich field to make the effort that will bring it into existence. By this we mean again, not the work of family history, but the compilation of carefully measured details, plans, structural features, and the like, with adequate photographic and architectural descriptive matter. Only the searcher in these fields can say with any degree of exactitude what a wealth of work is yet to be done to bring these buildings within the reach of the student. To be sure, a goodly number are in the hands of careful owners, but not always of overscrupulous owners, when the question of modern comfort is set over against that of voluntary preservation while, on the other hand a large number of these old buildings that yet remain are given no care whatever or are the property of families without adequate funds for comfortable living, let alone restoration or preservation of their ancestral homes.

(*To be continued*)

Efflorescence on Brick Work.

Efflorescence on brick work is formed by a process known as saltpetering and varies in its chemical composition as in its appearance, for it can be yellow or green, besides white. It is generally most noticeable in places liable to dampness, such as rain water heads, eaves, window sills and other places where rain is liable to soak into the bricks.

The crystals that form on the surface, chemically analyzed, prove to be sulphates, such as potassium sulphate, sodium sulphate, calcium sulphate, magnesium sulphate, these varying according to circumstances. Sulphate of magnesia is generally found in much greater quantity than the sulphate of lime, as it is far more soluble in water. If sea water or sea sand is used in the making of bricks, chlorides are almost sure to form, as potassium chloride and sodium chloride. In a few extreme cases it has been known for efflorescence to form by the absorption of ammonia from the air.

With the exception of calcium sulphate, all the salts above mentioned are readily soluble in water and most of them exceedingly so, but notwithstanding the relative insolubility of calcium sulphate, this compound is the most fruitful cause of efflorescence, which is much less readily washed off by rain than that resulting from more soluble salts.

The cause of efflorescence is sometimes due to the composition of the bricks or stones, and even sometimes to the mortar, and may be classified as follows:

(1) The use of clay containing soluble salts.

(2) The use of clay tempering water containing soluble salts.

(3) The formation in the kilns of soluble salts by the oxidation of minerals in the clay, or by the reaction of sulphurous kiln gases on the clay.

(4) The introduction of soluble salts into the bricks after burning, generally from the mortar employed.

The effects of efflorescence are not only unsightly, but they injure the surface of the wall, leaving damp patches, and it will eat through any coat of paint that has been applied after the efflorescence has once commenced, and has been known to break off pieces of material and disintegrate the surface of the wall.

Efflorescence can be avoided, providing suitable brick and mortar are used and the constructural part of the building is carried out as it should be, with water-tight gutters, good cornices and no leakage of any kind from any place.

If after all these precautionary measures have been taken efflorescence does occur, the suface may be treated by the application of alternate washes of soap and alum solutions in the proportions of 2.2 pounds of hard soap per gallon of water to one pound of alum per gallon of water. Instead of using common alum, it is more efficacious to employ aluminum sulphate in the alum wash. Surface deposits due to calcium sulphate and therefore not carried away by the rain can be removed by scrubbing the face of the work with hydrochloric acid diluted with about five times its volume of water. The brick work should be thoroughly moistened before the acid is applied, and after washing the surface with water to remove the traces of the acid. Another method is to wash down with a wash of Venetian red and levigated coke breeze.

To cover the wall with a wash of powdered stone or brick-dust, sand and water has had excellent results in removing the crusting, but it will only last for a short time and will have to be repeatedly renewed. The efflorescence will not be so marked after each application and should eventually disappear when the pores have been completely filled up.

A. Redfern Cornwell.

A Work of Reconstruction.

The Belgian Scholarship Committee was founded about a year ago in Washington by the well-known author, scientist, and traveller, Dr. Nevil Monroe Hopkins. At first it confined its activities to the District of Columbia, and its aim was simply to collect money for destitute scholars, but its scope has become broader and broader. The committee now includes among its members the presidents or chancellors of the following universities: Johns Hopkins, Princeton, Michigan, Missouri, Leland Stanford, Pennsylvania, George Washington, State of New York, Nebraska and many other leading men of this country.

The aims of the Belgian Scholarship Committee are the following:

1. To give to the Belgian scholars, writers and artists a chance to resume their work of art or science. To accomplish this aim the Belgian Scholarship Committee acts as a clearing bureau between the American universities and other educational institutions and the Belgian victims of the war.

2. To raise a fund for the reconstruction of a new and better Belgium, especially in the educational field.

The first aim is only of a temporary nature; the second one becomes every day more important. Our ambition is to be ready, as soon as the war is over, to help in putting Belgium on her feet again for a new and greater career.

We are appealing for books to the American libraries; we hope that they will be willing to give some of their duplicate copies and also that we shall receive free sets of their publications from the educational institutions and learned societies.

We cannot afford to store and keep the books until the end of the war. Therefore, we do not ask for books, but rather for promises of books. We suggest that the whole business be managed in the following way: Each library would simply send us a list of the books that it is willing to give to Belgium. This list would contain all bibliographical information that is necessary to identify the books without mistake (author, title, number of volumes, date and place of publication, editor). We should acknowledge receipt of these lists, and enter them on a duplicate list on cards. After the war, as soon as circumstances permit, the Belgian Scholarship Committee would write a letter to all the libraries, recalling their promise, and asking them to send all the books to some central storehouse in New York City, from where they could easily be shipped to Belgium.

We shall concentrate our efforts upon the making up of a collection of American books—books published in America or relating to American affairs. We should thus be able to offer to Belgium, soon after the war, an American library. No gift would be more appreciated and would do more to bring about a better understanding of American conditions and ideals, and greater international friendship.

Of course books given by publishers and authors will also be welcome. We would suggest leaving in each book its former ex libris, a short note being added to show how and when the transfer to Belgium was made.

We are also appealing for money. Money is needed to help Belgian scholars and artists; money is needed to carry on our activities; lastly, we must be able to remit a huge reconstruction fund (to be used for educational purposes only) to the Belgian people when the war is over.

We cannot expect to be helped by the general public, as is the case for the general relief fund, but we earnestly appeal to those who are especially interested in the development and diffusion of knowledge and art.

The best way to show one's sympathy is to become a fellow or member of the Belgian Scholarship Fund for the duration of the war and two years thereafter. The associate members agree to subscribe at least ten dollar a year; the sustaining members at least one hundred, and the fellows a thousand. Please draw checks to the order of John Joy Edson, treasurer, and send them to the Belgian Scholarship Committee, 309 Wilkins Building, Washington, D. C.

When the war is over the Belgian Scholarship Committee will publish a book containing a complete record of its activities and a list of the fellows and members.

We wish to lay stress upon the fact that ours is not simply a relief work; it is essentially a work of reconstruction, making for international friendship and peace.

GEORGE SARTON,
University of Ghent, Belgium,
Secretary of the Committee.